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ABSTRACT

Reprints of 18 articles pertaining to library microcomputing appear in this collection, the first of two volumes on this topic in a series of volumes of reprints from "ONLINE" and "DATABASE" magazines. Edited for information professionals who use electronically distributed databases, these articles address such topics as: (1) an integrated library system for a microcomputer; (2) desktop publishing in libraries; (3) color displays and information retrieval; (4) ordering slides via modem; (5) making a hard disk easy; and (5) downloading and post-processing online numeric data. The articles and columns appearing in this volume have been selected from "ONLINE" and "DATABASE" issues from 1985 through early 1988, with the majority in the 1986-1987 period. (CGD)

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LIBRARY MICRO-COMPUTING

VOL.1

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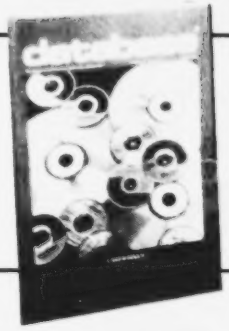

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LIBRARY MICROCOMPUTING - VOLUME I

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LIBRARY MICROCOMPUTING

PREFACE

This volume is part of a six volume series of reprints from *ONLINE* and *DATABASE* magazines. Both are edited for information professionals who use databases distributed electronically. Most readers do their searching through central databanks, such as DIALOG. Most of the coverage in *ONLINE* and *DATABASE* reflects this fact. However, a certain amount of coverage is also devoted to other media, such as laserdisks. (full coverage of laserdisks is in a companion journal, *the Laserdisk Professional.*)

The following articles and columns have been selected from *ONLINE* and *DATABASE* issues from 1985 through early 1988, with the majority in the 1986-87 period.

Other titles in the *Best of ONLINE and DATABASE* series include:

- Business & Finance (two volumes)
- Science & Technology
- Life Sciences
- Search Strategy & Tips
- End-users & Public Access

We hope you find these reprints useful. If you have any comments or questions, please write or call me directly toll free. Don't be bashful; we're a small shop and I love to hear from readers.

Jeff Pemberton, President and Publisher
Online, Inc.
11 Tannery Lane, Weston, CT, 06883
800/248/8466 Note: subscription orders and other information on *ONLINE, DATABASE* and *the Laserdisk Profesional* can also be obtained through the 800 number.

AN INTEGRATED LIBRARY SYSTEM FOR A MICROCOMPUTER

by Susan Way
Manager for Library Services
HCA Center for Research & Education
Medical Library

MILS (Micro-Integrated Library System) is a menu-driven software package for automating all library functions. The program is intended to be used in a small medical library.

This single-user software program for IBM-compatible microcomputers is written in dBASE II, and compiled with Ashton-Tate's Runtime. The program is very easy to use and requires little knowledge of microcomputers.

The well-written manual makes use and installation easy (though the on-screen menus are clear enough that the program can be run without using the manual). The author of MILS is Paul Kittle, Director of Medical Libraries, at Loma Linda University Medical Center. Kittle first developed MILS for his own use on a CP/M machine in 1983.

The MILS program comes with the complete 1985/1986 Brandon-Hill List, a core listing of recommended books and journals for the small hospital library, already entered in the program. [1] The books are cataloged in the National Library of Medicine classification system, and the library staff can easily edit this list to reflect their own holdings. This feature saves many hours of inputting book and journal titles.

SUPPORT, PRICE, AND DEMOS

The support the author offers his program is unbeatable. Users of MILS can communicate with Paul Kittle through Micro-Host (an electronic bulletin board). There is a section on Micro-Host reserved for technical support of MILS. Here one can leave and receive messages about problems with MILS, find out the latest news on MILS, and download new program files as they are written. New enhancements are constantly being added. As of October 1, 1987, purchased support was required. The cost of 12 months of support is $165.00. The support includes a copy of CarbonCopy, a program which allows Kittle to debug and work on your computer system from the library at Loma Linda University Medical Center. The support is well worth the price, especially for people with little microcomputer experience.

The cost of MILS is $395.00 with the Brandon-Hill list, $299.00 without the list, and $695.00 for the source code. MILS may be purchased from Paul Kittle, Director of Medical Libraries, Adventist Health Systems Loma Linda, P.O. Box 2000, Loma Linda, CA 92354. There is a demonstration disk also available for $25.00. If you decide to purchase the program, just return the demo for a $10.00 credit. Non-medical libraries definitely should purchase the demo disk to determine if MILS fits their particular needs.

MILS INSTALLATION

MILS comes with an installation program in which the librarian must choose several options. The librarian enters the name and address of their library. This address is used in the Interlibrary Loan section for requesting materials through CLASS. In the next option one decides what location names the library will use for materials in the database. We have chosen to use Bindery, On Order, and HCA Medical Library to let our patrons know where the materials are located. The install program asks for the drives on which the program files and book/journal files are to be located, and allows for color (cyan blue or amber red) or black & white display. Supported printers are the Toshiba 1351 or 351, IBM Quietwriter, Epson 80, Epson 100 and the NEC P6/P7. If you are considering purchasing MILS, and do not have one of these printers, talk to the author about possible support of your printer.

MILS can be purchased for a floppy or a hard drive system. As with any database, however, using MILS on a floppy disk system can prove to be quite cumbersome. On the floppy disk version of MILS the Brandon-Hill list is not an option because of its size. I would very strongly recommend using MILS on a system with a hard disk. We are presently using a 30MB hard disk and have on order a 44MB hard disk.

MILS COMPONENTS

MILS is divided into two basic sections, the first is the PATRON ACCESS section for use as an online catalog. The second is the HOUSE- ►

KEEPING section, which is reserved for library staff. This is where all adding, editing, and printing of records is done, and the section can only be accessed through the use of passwords.

PATRON ACCESS

The patron section is user-friendly. Very few people need any instruction to use it. The user is given a choice from a menu for searching BOOK HOLDINGS, JOURNAL HOLDINGS or MEDIA HOLDINGS. All options are chosen through the use of the function keys.

BOOK HOLDINGS

If BOOK HOLDINGS is chosen, a second menu appears on the right of the screen allowing a refinement of the search. (Figure 1 illustrates this second menu)

Patrons can search for books by the author's last and first name. The program allows for truncation. However, if a patron enters only a last name, several choices will appear on the screen. Records retrieved by any search method (Book, Journal or Media) will tell the patron the location of the material, call number, subject headings, circulation status, and due date. (Figure 2 illustrates the retrieval from an author search.)

Book searches may also be done by entering a title fragment or a complete title. One of the features of MILS is the lack of seriousness; Paul Kittle has put "remarks" throughout the program while MILS searches for data. (See Figure 1 for an example.)

Subject searches may be done in two different ways. The fastest method, referred to as "Primary Searching," uses an index based on the first subject heading in the record. The "Slow" method searches every subject heading on every record in the book database. The program will search every 50 records for the subject, and then stop and ask if you want to continue. The decision of which subject heading to place first becomes very important. We opted to have a broad subject heading first, followed by more specific headings.

The inputting of physical location of materials allows choices to be made by hospital libraries whose institutions have departmental libraries, or libraries who do all purchasing of books and journals for the entire hospital. Using MILS they are able to keep track of what materials are available in different locations in their institution.

JOURNAL HOLDINGS

Selecting the F2 key allows journal search-

FIGURE 1

PATRON ACCESS MENU

The patron first chooses F1, Book Holdings. He then may choose how he wants to search; F5, By Title, in this example. Highlighted is the title fragment to be searched.

```
                    | Micro-Integrated Library System |
                  at HCA MEDICAL LIBRARY
        | SEARCH MATERIAL |        | BOOKS   ACCESS |

     F1   - Book Holdings          F4   - By Book Author
     F2   - Journal Holdings       F5   - By Title
     F3   - Media Holdings         F6   - By Subject Listing
                                   F7   - By Physical Location

                     F10   -   To QUIT Program.
```

```
TITLE or TITLE FRAGMENT of the book you wish? + <RETURN>
    HAR


        Let me go back and check for that Title......
          I'll try not to get lost in the stacks...
```

```
                                Ok...
```

FIGURE 2

RETRIEVAL FROM AN AUTHOR SEARCH

```
     Findings from input ===> WAY

 Title /   Date of Publication    / Call Number          Author

CURRENT SURGICAL DIAGNOSIS & TREATMENT
 1985          Call No. ->  WO     100     D925c   1985
  Author: WAY, LAWRENCE
   Subject: SURGERY, OPERATIVE-DIAGNOSIS, SURGICAL
    Location: HCA MEDICAL LIBRARY
        * * *  That Book should be here in the Library...

            That is all I found from what YOU typed in...
  Press RETURN or SPACE to continue / Any OTHER key for Main Menu
```

FIGURE 3

INITIAL SCREEN FOR HOUSEKEEPING

The F9 key brings up the HOUSEKEEPING Menu on the lower half of this screen. Notice the choice of function key does not appear as one of the choices on the main menu on the upper part of the screen.

```
                  | Micro-Integrated Library System |
                 at HCA MEDICAL LIBRARY
          | SEARCH MATERIAL |

     F1   - Book Holdings
     F2   - Journal Holdings
     F3   - Media Holdings


                    F10   -   To QUIT Program.

                  | Press Number Key of Desired Option |

  1.  BOOK FILE OPERATIONS          5.  CIRCULATION
  2.  JOURNAL FILE OPERATIONS       6.  PATRON FILE OPERATIONS
  3.  MEDIA FILE OPERATIONS         7.  DEPARTMENT NAME EDIT
  4.  INTER-LIBRARY LOANS           8.  SET PRINTER CODES FOR ALL AREAS
                    9.  DAY END UPDATES & FILE MAINT.
```

ing by physical location, title, and subject. Title searching can be done using either the full journal title or the *Index Medicus* abbreviation. Subject searching of journals, books, and media is done in the same manner as books (described above).

MEDIA HOLDINGS

The options for media include fields for media author, title, subject, and media format. We find the media format field very useful for printing lists of media in our collection, by each format. These include software and videocassettes.

HOUSEKEEPING SECTION

MILS utilizes three levels of security to enter the HOUSEKEEPING section, since this area is where changes to the database are made. At the initial menu, the F9 key is pressed (the F9 key does not appear on the menu for security reasons), and a series of passwords must be entered before the menu appears. The HOUSEKEEPING area has functions for the adding, editing, ordering, and printing of journals, books, and media in the database. There are additional functions for interlibrary loans, circulation, patron records, and a once-a-day update to the database. This update can be done at the end of the day, and reindexes all the databases. (Figure 3 shows the main menu for housekeeping.)

The Monographs section allows: (1) Ordering of books. These can be printed on Highsmith book order cards. When the book arrives, the record is marked, and during the update of the book database, the marked records appear for the subject headings and call numbers to be added. This feature has saved the staff much time in typing and filing book order cards. We have even decided to do away with the order cards and send a printout of the book order file to the book jobber; (2) Editing of monograph records in the database; (3) Printing of spine labels and book cards (This feature alone is worth the price of the package.); (4) Printout of monographs by shelf list (call number), title (alphabetical), or subject. (See Figure 4.)

The Serials section edits the journals database, checks in the journals, notes the missing journals, and has a routing function. The journals printout has the ability to print by location, subject, or title.

The one drawback of the check-in function is the ability to see only the current issue. Once the record is edited to reflect the current issue, the record of the previous issue is erased. Only the range of month/year of journal titles is re-

FIGURE 4

SCREEN FOR MONOGRAPHS HOUSEKEEPING MENU

```
        |   WHAT TYPE OF MONOGRAPHIC HOUSEKEEPING DO YOU WISH?  |
     ==>  You MUST UPDATE to Search EDITED or RECEIVED Titles  <==

              (I)NPUT      -  Monograph Orders/ Received
              (E)DIT       -  Monographs in Data base
              (O)UTPUT     -  all Monographs to Printer
              (S)EARCH     -  the Monograph data base
              (U)PDATE     -  Checked-in / Edited Title
              (P)RINT      -  Spine Labels
              (T)YPE       -  Orders on Order Forms
             <RETURN>=======< to Main Menu >=====

        Please press the FIRST letter of the command you wish
```

FIGURE 5

JOURNAL CHECK-IN WITH CLAIMS

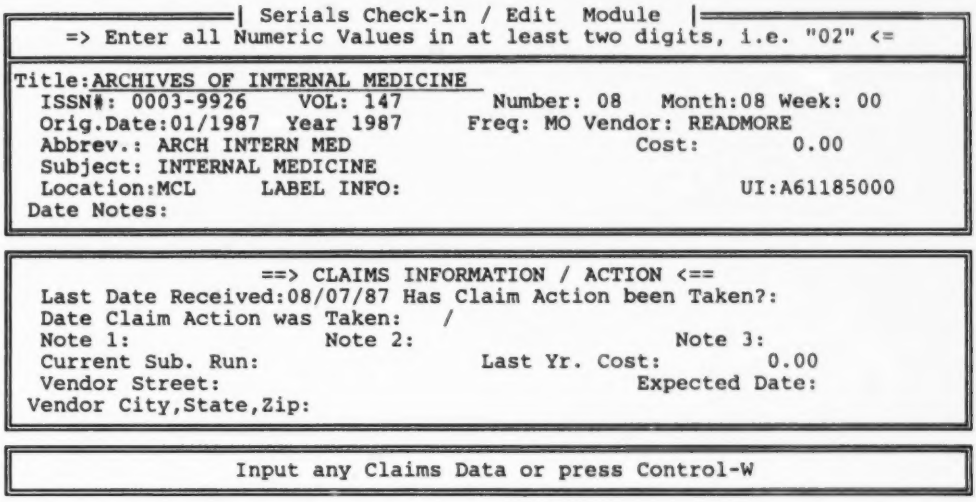
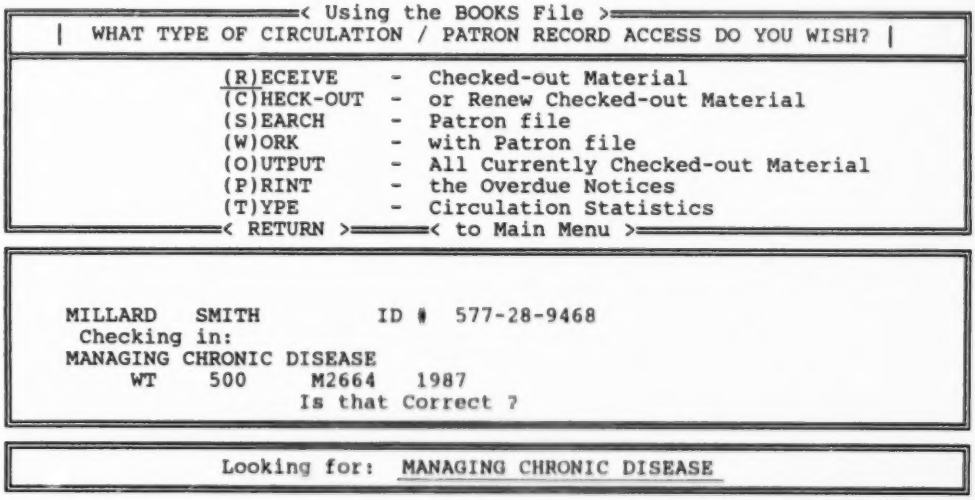

Serials Check-in / Edit Module
=> Enter all Numeric Values in at least two digits, i.e. "02" <=
Title:ARCHIVES OF INTERNAL MEDICINE
ISSN#: 0003-9926 VOL: 147 Number: 08 Month:08 Week: 00
Orig.Date:01/1987 Year 1987 Freq: MO Vendor: READMORE
Abbrev.: ARCH INTERN MED Cost: 0.00
Subject: INTERNAL MEDICINE
Location:MCL LABEL INFO: UI:A61185000
Date Notes:
==> CLAIMS INFORMATION / ACTION <==
Last Date Received:08/07/87 Has Claim Action been Taken?:
Date Claim Action was Taken: /
Note 1: Note 2: Note 3:
Current Sub. Run: Last Yr. Cost: 0.00
Vendor Street: Expected Date:
Vendor City,State,Zip:
Input any Claims Data or press Control-W

FIGURE 6

CIRCULATION SCREEN:
CHECKING IN BOOK TITLE


Using the BOOKS File
WHAT TYPE OF CIRCULATION / PATRON RECORD ACCESS DO YOU WISH?
(R)ECEIVE - Checked-out Material
(C)HECK-OUT - or Renew Checked-out Material
(S)EARCH - Patron file
(W)ORK - with Patron file
(O)UTPUT - All Currently Checked-out Material
(P)RINT - the Overdue Notices
(T)YPE - Circulation Statistics
RETURN
to Main Menu
MILLARD SMITH ID # 577-28-9468
Checking in:
MANAGING CHRONIC DISEASE
WT 500 M2664 1987
Is that Correct ?
Looking for: MANAGING CHRONIC DISEASE

tained. The date note field is too short to enter many gaps in journal titles. We have found this field useful for entering titles of individual monographic serials. We use REMO (Read-More) for journal control, and enter current journals on both systems since MILS provides us with the online catalog. We have just started using the routing function on MILS, and the staff prefers it to REMO's routing function for its ease of use. We plan to use this function to send tables of contents of journals to patrons. The claims function on MILS does permit the tracking of missing titles, and will produce a printout of these issues. (See Figure 5.) We use the claim function on REMO. Our claims forms are printed on REMO, and we send them through the facsimile machine to Read-More.

The Media section is similar to serials and monographs, except the Media record has a field for a brief description and media type.

There is an Interlibrary Loan section in MILS which our staff has been testing extensively, and due to their efforts, the author has just finished redesigning the screens. This will make MILS much more effective in this section. We use OnTyme and will be using Docline soon. MILS allows text to be uploaded to OnTyme using QMODEM. A statistics function has not been added yet, but when it arrives this section will be much more useful.

The Patron and Circulation sections alone are worth the price of the program.

The Patron and Circulation sections alone are worth the price of the program. (See Figure 6.) The library has the option of checking out books, journals, and media. Materials can be checked out using the last name of the patron, and the title of the material to be checked out. MILS will display any materials currently checked out by the patron. There are several choices of check-out periods for libraries to choose from.

Overdue notices have never been so easy. The notice has the due date, patron name, and address. By using window envelopes we make this a very fast process. MILS produces a printout of patrons by last name. Soon to be added to MILS are the circulation statistics.

HCA MEDICAL LIBRARY

The HCA Medical Library is a new library which officially opened in June, 1987. We moved into our present building in December, 1986, and began putting the library together. I had first "met" Paul Kittle when I called him about a program for downloading from **MEDLINE** which he had written. We kept up the correspondence on his electronic bulletin board, Micro-Host. After hearing about MILS, we decided to Beta test the new version of MILS (then version 1.4) with the idea of finally moving MILS into a network. Our situation was ideal, no books and journals had yet been purchased.

The library is designed around a Novell Network (Advanced 86/version 2.0a Netware). The network consists of an IBM AT with a 30-megabyte hard disk and five workstations, three IBM ATs and two IBM PCs. We are in the process of purchasing a new file server, the IBM PS/2 Model 60 in a nondedicated mode, and upgrading the Netware to Advanced 286/version 2.0. This will give us more hard disk storage for the network and enable the file server to be used as a workstation.

Although MILS is a single-user system, placing it in the network allows access to it from any workstation. With permission from Kittle, we copied selected files and programs from MILS and placed them in a separate subdirectory we call PATRON. The library patrons can access this section of MILS on the PC in the public area of the library, so effectively we have an online catalog. Each morning the patron files are updated using a batch file so all the holdings in PATRON are current.

The HCA Medical Library has had great success with MILS. Although in version 1.6 we still occasionally get dumped from the program, the solution to this problem has been a quick note on Micro-Host and a new file to download the next day. The "dump" is usually the result of a new enhancement or a change we have requested. CarbonCopy will allow the user to diagnose problems for libraries lacking personnel with microcomputer skills.

FUTURE ENHANCEMENTS

Circulation and Interlibrary Loan statistics will be added soon. The HCA Medical Library and Loma Linda University Medical Center Library have recently purchased light pens, which means MILS can read bar codes. We have just acquired a Hewlett-Packard Laserjet Series II printer, and plan to print our own bar codes. Hewlett-Packard makes a font cartridge with bar codes.

Because MILS performs so many necessary library functions, the staff is eagerly awaiting the network version of MILS, known as MCBLIS. We are in the testing stages with MCBLIS. MCBLIS is written in dBASE III PLUS, and should be available by July, 1988. The price for this package will be between $3000 and $5000.

CONCLUSION

I highly recommend MILS for a hospital library. The package does not pretend to have all the functions that a costly integrated library package would, but still allows full automation of a small medical library, and is a bargain at the price. Since some of the functions are better then others, some libraries will want to supplement these areas with other software, depending on their needs. The expert support customers receive with MILS is unavailable with any software package we have used, including those for which we pay an additional cost for technical support.

REFERENCES

[1.] Brandon, A.N. and Hill, D.R. "Selected List of Books and Journals for the Small Medical Library." *Bulletin of the Medical Library Association* 75, No. 2 (April 1975): pp. 133-165.

SOFTWARE PROFILE

(From the SOFT file on BRS)

AN	ACC NUMBER: 6381. 8608.	
SN	SOFTWARE NAME	**MILS**
	Version	1.4
	Date Released	JAN 1986
	Cost	$395.
AP	APPLICATION	LIBRARY APPLICATIONS, ACQUISITIONS, CATALOG SYSTEM, CIRCULATION, INDEXING, INFORMATION RETRIEVAL, SERIALS CONTROL. An integrated library package for small libraries. Specifically targeted at the Medical or Hospital Library, comes with the Brandon-Hill List already input and cataloged. Only program currently legally containing this list. Portions of monies from program are donated to Medical Library Association.
AD	Name	Loma Linda University Medical Center
	Street	P.O. Box 2000
	City, St., Zip	Loma Linda,CA 92354
	Phone	(714) 824-0800
	Contact	P. Kittle, Medical Library.
PD	PRODUCT DESCRIPTION	Features include: complete circulation; journals and monograph ordering; control; Ill's; prints check cards and spine labels; tracks and maintains audiovisuals; prints overdues; notifies when book or other media is checked out when searching card catalog; cataloging. Designed to provide a maximum of features at a minimum cost.
OS	OPERATING ENVIRONMENT	
	CPU	8086, 8088
	Operating System(s)	MSDOS, PCDOS
	Languages	Written in dBase II compiled
	Disk Size	Supports 3.5" and 5 1/4" disks
	Soft-Hard Disks	Supports floppy and hard disks
	Installation	Menu-driven.
HD	HARDWARE REQUIREMENTS	128K RAM minimum; any MSDOS IBM and compatibles; 2 disk drives; hard disk optional, recommended.
XA	OTHER SOFTWARE USED WITH SYSTEM	Includes free copy of QMODEM.
DO	DOCUMENTATION	A printed manual is included with the program, containing a table of contents, a trouble-shooting section and sample files or programs. Update information is provided and backup copy is supplied.
WP	WHERE PURCHASED	Contact Loma Linda University.

Communications to the author should be addressed to Susan Way, Manager for Library Services, HCA Medical Library, 310 25th Avenue North #305, Nashville, TN 37203; 615/340-2660.

software pick of the month

by Paula Hane
Editor, SOFT

This is the first appearance of this feature in *DATABASE*. Each month, in *ONLINE* and *DATABASE*, a program will be chosen and listed with its record from the **SOFT** database. Several other programs of note will be mentioned.

This month's choice, PARADOX, version 2.0, is an update of the popular, multifeatured database program that was first released a year ago. Besides being easy to learn and use, this program should be attractive to local area network users. If you bought Version 1.1 between April 18 and May 18, 1987, the upgrade to 2.0 is free; if you bought before April 18, the upgrade is $199.

AN ACC NUMBER:006308. 8709.
SN SOFTWARE NAME ..... **PARADOX**
Version 2.0
Date Released 1987
Cost ..... $725.; $995. multiuser.
AD Name ..... Ansa Software
Street ..... 1301 Shoreway Road
City, St., Zip ..... Belmont, CA 94002
Phone ..... (415) 595-4469
AP APPLICATION ..... DATABASE MANAGEMENT, RELATIONAL, GENERAL PURPOSE DBMS.
PD PRODUCT DESCRIPTION ..... A full-featured, high-end database program that works both with data tables like a spreadsheet, and database forms like a DBMS. Uses the query-by-example method for working with data. Version 2.0 adds 33 new commands to PAL, the Paradox Application Language, and a new menu-driven applications generator so novice users can build applications without knowing how to program. The program now supports a number of Local Area Networks and EMS (Expanded Memory Standard), and offers individual password and access protection capabilities. The report facilities have been enhanced, including multi-column capability, and the report process can be entirely menu-driven. The program imports and exports in a number of popular formats. Not copy-protected.
OS OPERATING ENVIRONMENT
Operating System(s) ..... DOS 2.0 or later; DOS 3.1 or later (network).
Disk Size ..... 5 1/4", 3.5"
HD HARDWARE REQUIREMENTS ..... IBM PC, XT, AT, PS/2 or compatibles. 512K and two floppy drives; 640K per workstation and a hard drive on network server.
XA OTHER SOFTWARE USED
WITH SYSTEM ..... Compatible with Novell Advanced Netware, 3Com3+, IBM Token Ring, or PC Network. Automatic conversion of delimited ASCII, Symphony, 1-2-3, dBASE, PFS File, VisiCalc, and DIF files.
DO DOCUMENTATION ..... Set of manuals, quick reference guide, keyboard templates, online help.
SR SOFTWARE REVIEWS .....
MAGAZINE NAME: *InfoWorld*
ARTICLE TITLE: Paradox Database Offers Features, Reliability.
REVIEWER NAME: Crabb, Don
DATE: Aug. 17, 1987
VOLUME: 9
NUMBER: 33
PAGES: 45-46.
COMMENTS: Very good overall rating and for general performance. Rated excellent in documentation and ease of learning and use. The program provides a nice balance between function and speed. No significant disadvantages reported for this solid product, which is rated a very good value. It is one of the easiest-to-use databases in a LAN setting.

For more information about this month's Noteworthy Releases, or other software, search File SOFT on BRS.

Communications to the editor of the SOFT database should be addressed to Paula Hane, Lakeview Terrace, Box 153, Amawalk, NY 10501; OnTyme—CLASS.ONLINEPH.

NORTON UTILITIES. . .A TOOL FOR RECOVERING "DELETED DATA" AND RESCUING A MIS-FORMATTED HARD DISK

by Brian Phillips
Computer Specialist
U.S. Naval War College

Every microcomputer user will inadvertently erase a file, or format a disk, wiping out valuable data that was not backed-up. It is Murphy's Law of Computing. The novice user will pull his hair, mutter expletives deleted, and reinforce his opinion that computers cannot be trusted. The veteran user will calmly reach for his Norton Utilities disk and go about recovering the "lost" files. Anyone who is not familiar with data recovery programs, like Norton Utilities, should be—*before* disaster strikes.

Norton Utilities is like an extension of DOS and contains a host of commands that Microsoft forgot when they wrote MS-DOS. The Norton Utilities' set of 23 programs come on two uncopyprotected disks, and are available in two versions: Version 4.0 and the Advanced Edition. The program runs on the IBM PC and compatibles, and requires 128KB of memory and DOS 2.0 or higher. The Norton Utilities accomplish two functions: data recovery and disk management.

DATA RECOVERY

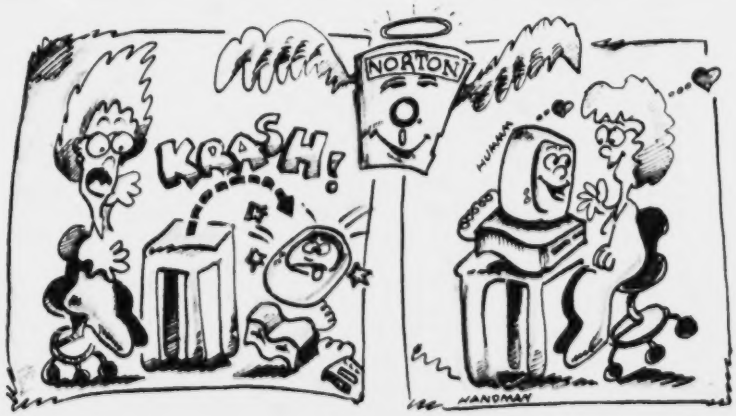
The data recovery programs in Norton Utilities can *unerase* most deleted files and *unformat* an accidently formatted hard disk. Files that are erased using the DOS ERASE or DEL command are not really deleted. They only disappear from the directory. DOS overwrites the first character of the filename with the Greek character sigma. This informs DOS that it is now okay to write data to that space on the disk. So to recover a lost file with Norton's unerase command (NU), you need only know the first character of the filename and not have already overwritten this space on the disk. That is why it is important if you "lose" a file, that you *stop everything and do not write anything to the disk.*

Similarly, when a hard disk is formatted, it is not really wiped clean. DOS only erases the root directory and the file allocation table (FAT). Norton Utilities' FORMAT RECOVER (FR) command reconstructs the FAT and the root directory from a file that is written to the disk by an AUTOEXEC.BAT file every time you boot up. So if you accidentally format the disk, you should be able to recover all the data up to the last time you booted up. (Note: Compaq MS-DOS 2.11 through 3.2 and Burroughs and AT&T MS-DOS 2.11 will not work with any of the currently available format recover utilities.)

Norton Utilites will not recover all data from all disasters. A mechanical problem, such as a disk head crash, or an erased file that was mistakenly overwritten, cannot be fully recovered. Many times something can be salvaged even from these major disasters. Using the TEXT SEARCH (TS) command, you can search the disk to find the sectors holding erased data which was not overwritten, or damaged, and recover at least part of your file.

DISK MANAGEMENT

Norton Utilities is primarily known for its data recovery, but most of the programs in Norton Utilities are designed to make managing your disk easier. These commands allow you to sort your directories (DIRECTORY SORT), run diagnostics (DISK TEST), search



for lost files and subdirectories (FILE FIND), set screen colors and attributes (SCREEN ATTRIBUTES), print a graphic display of your directory (LIST DIRECTORIES), create interactive batch files (ASK), and can even program your computer to play "Mary Had a Little Lamb" with the BEEP command.

An especially valuable disk management program that is available only in the Advanced Edition is SPEED DISK. The Speed Disk program rearranges the logical structure of your hard disk for optimized seek time. The program keeps the files on the hard disk contiguous. MS-DOS writes files to any available space on a disk so that files on a hard disk soon become fragmented. Part of a file may be on one sector of the disk and another part of that file will be on a different sector. By keeping the files contiguous, the disk head has less distance to travel, and access is consequently faster. There are standalone programs available that will also do this (Disk Optimizer), but the Advanced Edition saves you the added expense of a separate program.

USING NORTON UTILITIES

For the user's indoctrination and reference, the package includes a manual, a quick reference card, and with the Advanced Edition, the *Norton Disk Companion* (a guide to understanding how disks work). The Norton Utilities 174 page user manual is laid out just like your DOS manual. All of the program's two and three letter commands are arranged in alphabetical order, followed by the command's purpose, its format, all switches, a brief description, examples, and tips and suggestions. The manual also contains a 20 page tutorial that takes you through an interactive session of unerasing actual files that are copied from the distribution disk.

Using Norton Utilities is again like DOS. All utilities can be directly executed by entering their two, or three, letter command. Commands can also be executed from the NORTON INTEGRATOR which is the program's menu-driven approach. The Norton Integrator provides a convenient and easy way to run any of the commands. You simply execute the menu (NI), and the Norton Integrator displays a list of the commands on the left of the screen and a quick summary of the command on the right. As you cursor through the menu, each command is highlighted in inverse video and the command summary changes to correspond to the highlighted command. To execute a command, you just press ENTER when the desired command is highlighted.

Norton Utilities is fairly easy to learn and use for uncomplicated data recovery operations and some disk management functions. QUICK UNERASE (QU) works fine for simple file recovery and makes the process of restoring deleted files painless. However, most Norton Utilities commands are not for inexperienced users, and in their hands can be dangerous. Almost all commands rely on a substantial knowledge of DOS. For example, to use the Format Recover function, you must first modify your AUTOEXEC.BAT file. If you do not know how to write batch files, the Format Recover command will be of no use. Norton Utilities can provide control over your disk down to the cluster level. These functions are a bit too esoteric for the average user. Many of Norton Utilities' capabilities are best left to experts, or to hackers who are tinkering with their own machines, and not your library's! If you do not know what in interleave factor is, then it is best not to change it.

Norton Utilities is needed by hard disk users only. Using Norton Utilities on a floppy disk system is overkill. Users who want data recovery capability on a floppy disk system can use the shareware program called Ultra-Utilities. It is available on most bulletin boards or through users groups.

VERSION 4.0 VERSUS THE ADVANCED EDITION

Peter Norton sells two versions of his Utilities: Version 4.0 and the Advanced Edition. They are the same except that the Advanced Edition contains two additional programs plus an enhanced version of the main program. The enhancements to the main program include a directory editor, a file allocation table editor, and a partition table editor. These editors allow you to maintain your hard disk down at the cluster or sector level. The Advanced Edition's two additional programs are the Speed Disk and Format Recover programs mentioned above.

The Format Recover program is the reason why everyone should spend the extra money to buy the Advanced Edition rather than Version 4.0. The largest potential disaster that can befall a hard disk is the FORMAT command. With this command, you can wipe out megabytes of data with the depression of the Enter key.

NORTON UTILITIES ADVANCED EDITION VERSUS THE COMPETITION

With the release of the Advanced Edition so soon after a major revision, it seems like the Advanced Edition was an afterthought to Version 4.0. The Advanced Edition is obviously Peter Norton's response to his competitors. Norton Utilities has been the undisputed leader in data recovery since its introduction over five years ago. There are now ten competitors vying for a share of the market and they are getting closer in capabilities to Norton Utilities. Of particular note is Mace Utilities. Mace

Utilities had an unformat command available before Norton Utilities, and is widely heralded for its data recovery abilities. When Norton came out with the Advanced Edition with his own unformat command, Paul Mace came out with an updated version (4.10) of Mace Utilities. The newest version of Mace Utilities matched some of Norton's disk management capabilities and added some data recovery features that Norton Utilities is lacking. (Most notably the ability to unformat a floppy disk). This game of one-upmanship can only mean a better product at a better price to the consumer. At present, Mace Utilities has slightly more powerful data recovery capabilities, but Norton Utilities has better disk management tools and is more user-friendly with better documentation. Even with Norton's Advanced Edition at $85 (discounted) versus $60 for Mace Utilities, the Norton Utilities Advanced Edition is the better buy. To keep the competitors at bay, Peter Norton would have been wiser to replace Version 4.0 with the Advanced Edition, and keep Version 4.0's lower price, instead of offering two separate products.

CONCLUSION

Norton Utilities Advanced Edition should be on every hard disk. It is like owning insurance. It may be of little use until needed, but when needed, it pays for itself tenfold. Peter Norton has become a guru in the PC world, publishing five books and authoring a monthly column in *PC Magazine*. The quality of Norton Utilities reflects his reputation and is highly recommended.

- Norton Utilities ver. 4.0, Advanced Edition
  Peter Norton Computing, Inc.
  2210 Wilshire Blvd., Suite 186
  Santa Monica, CA 90403-5784; 213/453-2361
  Version 4.0 $99.00 ($55.00 discounted)
  Advanced Edition $150.00 ($85.00 discounted).
- Ultra Utilities (available from)
  PC Software Interest Group (PC-SIG)
  1030 E. Duane, Suite J
  Sunnyvale, CA 94086
  Price per disk: $6, plus $4 handling.
- Mace Utilities ver. 4.10
  Paul Mace Software
  123 N. First St.
  Ashland, OR 97520; 503/488-0224
  $99 ($60 discounted).
- Disk Optimizer
  SoftLogic Solutions, Inc.
  530 Chestnut St.
  Manchester, NH 03101; 800/272-9900
  $49.95 ($35 discounted).

FIGURE 1

The Norton Integrator displays a list of commands on the left of the screen and a quick summary of the command on the right. As you cursor through the menu, each command is highlighted in inverse video and the command summary changes to correspond to the highlighted command. In the menu below, the Norton Utility (NU) command is highlighted.

```
                                The Norton Integrator

ASK
BEEP                            Norton Utility                  NU [filespec][switches]
DS   Directory Sort               View and edit any disk area; use powerful data-
DT   Disk Test                    recovery tools to UnErase deleted files,
FA   File Attributes              recover lost data, and repair damaged disks.
FF   File Find
FI   File Info                  NU exam.me
FR   Format Recover               Run NU, with "exam.me" opened for editing.
FS   File Size
LD   List Directories           Switches
LP   Line Print                   /D0    Default screen driver, for 100% compatibles
NCD  Norton CD                    /D1    Screen driver for BIOS-compatible machines
NU   Norton Utility               /D2    Ansi.sys screen driver for non-compatibles
QU   Quick UnErase                /Bn    Set Background color; n=0 to 15
SA   Screen Attributes            /Fn    Set foreground color; n=0 to 15
SD   Speed Disk                   /BW    Use with monochrome monitor on a CGA card
SI   System Information           /EBCDIC Use EBCDIC character encoding
TM   Time Mark                    /EXT   Display EXTended characters (above 127)
TS   Text Search                  /TV    For TopView, Windows and other
                                         environments
UD   UnRemove Directory           /M     Maintenance--bypasses logical sectors (AE)
            more. . .             /P     Display printables only; suppress graphics
NU                                                              Press F1 for Help
```

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TEXTRA: WORD PROCESSING WITH A SUPER LOW PRICE AND HIGH PERFORMANCE — A REVIEW

by Brian Phillips
Computer Specialist
U.S. Naval War College

Textra has probably had more accolades bestowed upon it per review than any other word processing program. *PC World* readers rated Textra among their top five favorite word processing programs in last year's "World Class" poll. *PC Magazine* benchmarked it as one of the fastest word processors, named it their "Editor's Choice" among low cost word processing packages, and called it "today's best buy in commercial software."

So why do blank expressions appear on people's faces when Textra is mentioned? "Never heard of it," is the common response even from microcomputer aficionados. Textra has never been reviewed in the library literature, yet many programs with far less critical acclaim have. The program's relative obscurity is probably due to a lack of advertising. Unlike, WordStar, Multimate, PFS Write, and a host of others, Textra does not have full page advertisements in the industry press. Textra's only advertisement is a brief one column classified ad in the back of *PC World*. No full page ads means no advertising overhead passed on to the consumer. The lack of advertising and the program's low cost also means that Textra is not widely distributed. It is not available through mail order houses or through computer retail chains such as Computerland. Textra is sold only through direct mail from its publisher, Ann Arbor Software. These cost-cutting measures may attribute to its obscurity, but they permit Textra's most astonishing feature—its price. At $29.95, Textra deserves all the reviewers' praise.

Textra runs on the IBM PC, and compatibles. It comes on a single uncopyprotected disk and requires one disk drive, 256KB memory, and DOS 2.0 or higher. Textra has so many features that it is easier to list what it will not do. Textra is not a viable candidate for serious heads-down word processing. It does not have a mail-merge function, index generator, automatic footnoting, boilerplating, sophisticated formatting, or built-in spell checker like Microsoft Word, Multimate, and Word Perfect. To compare Textra, at $30, to these three to four hundred dollar programs is unrealistic. Textra does compare favorably with word processing programs in the one to two hundred dollar range. Textra is in the same league as PFS Write, Perfect Writer, Displaywrite I, Executive Writer, and Easy. Textra not only compares well with these programs, it is superior in many of its functions.

The first thing you notice about Textra is its speed. Textra is almost completely menu-driven, but the menus never get in the way to slow you down. Textra has been benchmarked for speed against command-driven programs such as XyWrite and WordStar and equaled, or beat them in most tests. Textra is a RAM-resident program, so the entire program and document is loaded into memory. This allows it to operate at the speed of RAM and not get slowed down by frequent disk access. A trade-off that Textra makes for its speed is its 30- to 40-page document size limit.

Textra is not only fast in its actual execution, it is fast for the user to learn and use. The single program disk contains its own tutorial. This series of tutorials, called "film-on-disk tutorials," is an animated 41 minute introduction to Textra's features. Like a film, it can be slowed down, fast-forwarded, paused, and backed up. In addition to the tutorial, Textra has context sensitive help screens that can be invoked at any point in the program by pressing the ALT-H keys. The help screens are in a standard Textra document file and can be eas-

ily customized by editing the file. Textra's 288 page manual is as well thought out as the program. A two page appendix called the "Command Summary" is the only part of the manual that you may need to consult after you have become familiar with the program.

Textra is fast to use because you seldom need to go hunting through the manual to find out what to do next. You are never left staring at a blank screen. There is always a menu present on the bottom line of the screen. With one keystroke, you can toggle between three main menus or execute commands directly using ALT, CTRL or Shift key combinations. From within the main editing menus, submenus can be called up for specific functions, such as highlighting, printing, or moving text. Almost all functions are controlled by using the ten function control keys. Textra simply changes the designation of the function keys as you move from menu to menu. This allows the program, in most cases, to be controlled with single keystrokes. There is not a multitude of cryptic key sequences required like in WordStar. All other keys do what they are supposed to. The DEL key deletes character by character, the INS key toggles between the insert and overwrite mode, the backspace key backspaces while erasing, the PgUp and PgDn keys move to the top and bottom of the printed page, and the arrow keys control the cursor. With the Esc key, you can backup through the menus or undo the previous command if you inadvertently erase some text.

Textra is close to a true WYSIWYG (what-you-see-is-what-you-get) word processing program. On a monochrome monitor, bold appears in bold, underlined text is underlined, justified text is justified, and centered text is centered. The only exception found was that superscript and subscript characters do not appear on the screen above and below the line.

Anything that you do not like about Textra can probably be changed. Textra has a program called TXCUSTOM on the program disk that allows you to customize Textra to look and act just about anyway you want. You can customize drive defaults, screen colors, automatic backup, automatic reformat, display the ruler line, not display the ruler line, start in insert mode, or start in overwrite mode, and set defaults for just about any function Textra can accomplish.

With Textra's price/performance ratio, it is almost unfair to criticize the program. Most of Textra's shortcomings can be overlooked or overcome. The 30- to 40-page document size limit can be overcome by breaking the document into parts. Textra allows for this nicely by letting you start your page numbering at any number from one to 250. The lack of a spell checker can be overcome by purchasing a generic spell check program that works with standard ASCII files such as Webster's New World Spelling Checker. Or you can wait for Version 5.0 of Textra which will contain its own spell checker. The lack of specific print drivers does not hamper Textra's printer control unless you are keying in subscript, superscript, foreign language, or math symbols. If you use these characters, Textra requires you to configure the program to your printer. This is not an easy task unless you are familiar with your printer's ASCII control codes. Textra's unsophisticated formatting is acceptable if your documents are usually uncomplicated. Even an occasional complex format can be accommodated by using secondary margins and protecting any tables or columns from reformatting.

The only thing confusing about Textra is its price. Ann Arbor Software has always been unsure about how to market Textra. The program was first sold in 1983 for $95 and was marketed in the traditional manner. Textra failed in this approach. So Ann Arbor Software dropped the price to $49.95 and then to $9.95. They even gave away fully functional copies of the program with built-in speed traps that slowed you down but nonetheless provided a pretty decent word processing program for free. This marketing ploy worked. At $9.95 people noticed Textra even without a large scale advertising campaign. With the introduction of a new version, Ann Arbor Software raised Textra's price to $19.95 and a subscription service was started where they provided program updates and revised documentation on disk as they were written. Ann Arbor is still pursuing this marketing method today. Owners of the current Version 4.0 can pay $40 and receive updates every six to eight months until the final version of Textra 5.0 is complete. At this time, subscribers will receive the final version and a bound manual. The subscription service should be avoided. Textra is using its customers as beta test sites for its version updates. In one subscription update to version 3.1, the highlighting function did some pretty strange and unexpected things. Buy the latest final version and avoid the subscription service.

CONCLUSION

If you are looking for a fast, easy to use word processing program, and your documents are usually uncomplicated, then Textra is hard to beat. In its price range, it is impossible to beat. Even if you have standardized on one of the full-featured packages, Textra is a good alternative for use by occasional users who do not need, or wish to learn, a more complex program. ►

- Textra, Version 4.0
  Price: $29.95
  Publisher:
  Ann Arbor Software
  345 S. Division St.
  Ann Arbor, MI 48104
  313/796-9088.

- Webster's New World Spelling Checker
  Price: $59.95
  Publisher:
  Simon & Schuster
  Electronic Publishing Group
  1230 Avenue of the Americas
  New York, NY 10020
  212/245-6400.

FIGURE 1

Textra's opening menu lists options on the left and the disk directory on the right. You can load an existing file by entering the number next to the filename or create a new document by entering a filename.

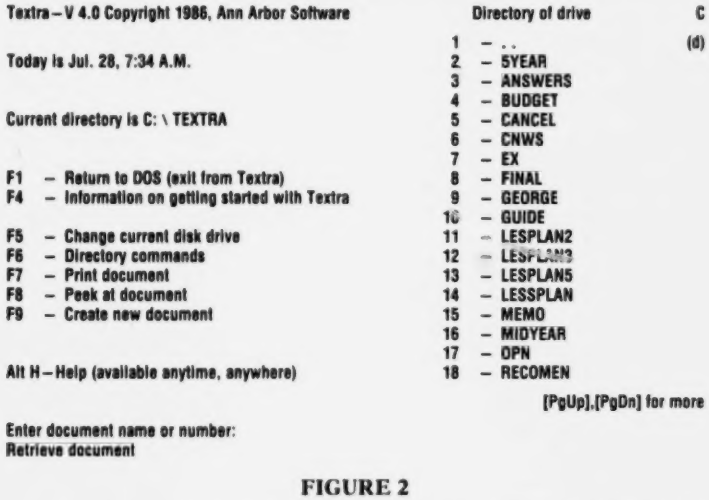
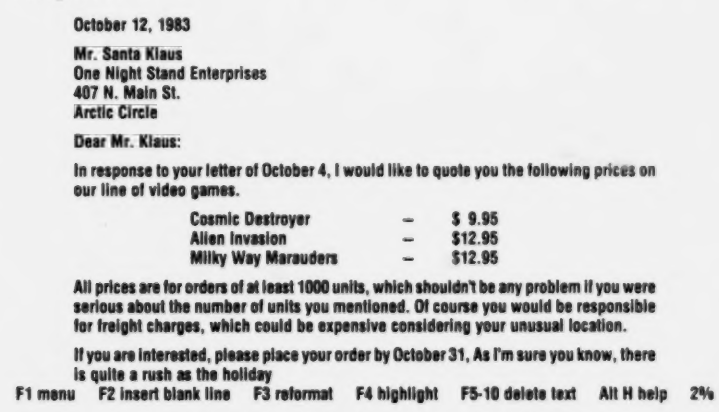

Textra—V 4.0 Copyright 1986, Ann Arbor Software
Today is Jul. 28, 7:34 A.M.
Current directory is C: \ TEXTRA
F1 – Return to DOS (exit from Textra)
F4 – Information on getting started with Textra
F5 – Change current disk drive
F6 – Directory commands
F7 – Print document
F8 – Peek at document
F9 – Create new document
Alt H – Help (available anytime, anywhere)
Enter document name or number:
Retrieve document
Directory of drive C
1 – .. (d)
2 – 5YEAR
3 – ANSWERS
4 – BUDGET
5 – CANCEL
6 – CNWS
7 – EX
8 – FINAL
9 – GEORGE
10 – GUIDE
11 – LESPLAN2
12 – LESPLAN3
13 – LESPLAN5
14 – LESSPLAN
15 – MEMO
16 – MIDYEAR
17 – OPN
18 – RECOMEN
[PgUp],[PgDn] for more

FIGURE 2

Textra's editing screen is clean except for the menu line. The F1 key toggles between three menus. All functions can be executed from these menus. There is no need to remember commands or use a keyboard template.


October 12, 1983
Mr. Santa Klaus
One Night Stand Enterprises
407 N. Main St.
Arctic Circle
Dear Mr. Klaus:
In response to your letter of October 4, I would like to quote you the following prices on our line of video games.
Cosmic Destroyer – $ 9.95
Alien Invasion – $12.95
Milky Way Marauders – $12.95
All prices are for orders of at least 1000 units, which shouldn't be any problem if you were serious about the number of units you mentioned. Of course you would be responsible for freight charges, which could be expensive considering your unusual location.
If you are interested, please place your order by October 31, As I'm sure you know, there is quite a rush as the holiday
F1 menu F2 insert blank line F3 reformat F4 highlight F5-10 delete text Alt H help 2%

Communications to the author should be addressed to Brian Phillips, U.S. Naval War College, Computer Services Dept., Newport, RI 02841; 401/841-2456.

TAKING THE PLUNGE: ENTERING THE WORLD OF MAIL ORDER

by Alan King
Central Maine Power Company

Whether it is from television, radio, magazines, or newspapers, each one of us is bombarded daily by hundreds of slick and not-so-slick advertisements. Many of these advertisements hype products that are familiar and easily obtainable at the local market or department store. Others entice the buyer into the somewhat nebulous world of mail order shopping. This component of the computer marketplace has experienced unprecedented growth over the last few years, and shows no signs of slowing down. "Between 1980 and 1986," according to a December 1987 *MACWORLD* article, "the number of companies selling computer products through the mail quadrupled, with business accelerating at an average rate of 55 percent per year." [1] Consumers, once wary of entering this market, are now finding its lure too strong to resist. This article is an attempt to explore the issues involved in mail order shopping and to interject a little commonsense.

WHY BUY MAIL ORDER?

Perhaps the most compelling reason to purchase hardware and software through the mails is price. In nearly every circumstance, mail order products can be found that are substantially lower in price than those offered by the average local computer store. Typically, mail order products can save buyers 25% to 50% off retail prices. For instance, WordPerfect 4.2, with a manufacturer's suggested retail price of $495.00 is sold by my local computer store for $445.00. That same program is offered by a reputable mail order firm for $199.00. Hardware can also be found at "bargain" prices. The Leading Edge Model "D" computer, with 1 floppy drive and a 20MB hard disk is sold by that same local computer store for $1695.00. Yet, the mail order price is only $1195.00. Figure 1 draws this comparison even further by illustrating the price differences for a complete system (hardware and software). To the individual or institution on a limited budget, mail order may not be just an option, but a necessity.

In addition to price, selection is a major reason to use mail order. A glance at any computer magazine confirms this observation. Mail order firms offer an almost overwhelming array of different products and manufacturers. While your local store might stock five or ten different computer brands, their mail order counterparts collectively offer hundreds, many which are unavailable by any other means. In order to get this same variety, or even a close approximation locally, you would have to travel from store to store. Mail order firms allow you to comparison shop at home, by just opening a copy of the *Computer Shopper, PC WORLD, MACWORLD* or any of a number of other computer magazines.

THE DRAWBACKS

Despite the obvious benefits of lower prices and tremendous selection, buying by mail order has its drawbacks. The very nature of the business itself, requiring someone to purchase a product sight-unseen, provides fertile ground for the unscrupulous and greedy. Logically, as the volume of mail order purchases has increased, so too has the volume of complaints. Fly-by-night companies long on promises and short on products, as well as established companies undercutting prices and thus also their own profit margins are not uncommon among this new marketplace. Neither are unaware consumers, who are often the real losers.

In mail order there are certain truisms. One is to be prepared to spend some time on the telephone. Orders are placed, questions are posed, and complaints are aired using the phone. This can be a very convenient process if the order proceeds as planned. However, when problems arise, the limitations of the ►

phone become very apparent. On the local level, it is not difficult to make your presence felt in a very "real" way (we have all come to realize that a good tantrum in the midst of a crowded showroom can do wonders to clear-up "misunderstandings"). Dealing with mail order problems however, can be a study in both patience and frustration. Busy signals, choruses of "please hold," and "Mr. X will return your call as soon as possible," as well as "that item is currently out-of-stock" are all familiar to the mail order veteran.

Another truism of mail order shopping is to be prepared to get intimately acquainted with your computer. When the new modem arrives it is the purchaser's responsibility to see that it is properly installed. Mail order provides the product, you provide the expertise. For the novice computer user, this can be an especially frightening experience. In response, many mail order companies and most manufacturers have established technical support lines to assist you in the installation procedure and to offer continuing support as needed. The quality of advice varies from company to company, and may or may not be sufficient to answer all your questions. Backup expertise, in the guise of a "computer-literate" friend or colleague is a prudent investment, and a relationship worthy of careful cultivation. There is no great mystery to installing hardware and software. Intelligent instructions and patience are usually more than enough to see the task through.

However, before installing any piece of hardware be sure to check the fine print on your computer's sales agreement and/or warranty. Some manufacturers void those agreements if anyone other than an authorized dealer does the actual installation. In these instances, any savings realized by buying a product through mail order could be negated by the removal of a warranty or guarantee.

CHOOSING THE RIGHT COMPANY

The best way to evaluate a company's reputation is by word of mouth. Get the good, the bad, and the ugly first-hand from the people who have had experience in the market. Ask the opinions of friends, colleagues, patrons, and even the purchasing or MIS departments of local businesses, colleges, or governmental organizations. No one has to "go it alone." There are no Purple Hearts for the bruised mail order shopper.

Another excellent source for information exchange is your local computer user's group. If one is not available in your area, I strongly suggest membership in the Boston Computer Society (1 Center Plaza, Boston, MA 02108). Though based in Boston, this organization has more than 25,000 members worldwide. BCS members provide a diversity of information on just about any topic in the computer field. Special interest groups, that expand upon this diversity, exist in a number of different subject and product areas. The Society also maintains listings of "experts" who are available to answer questions and offer advice. In addition to the Boston Computer Society, there are many other smaller user groups and BBS's (bulletin board services) available throughout the United States and Canada. Listings of these groups can be found in the *Computer Shopper* and other similar publications.

Finally, we should not forget the old standbys. The Better Business Bureau and the Direct Marketing Association (6 E. 43rd St., NY, NY 10017) have both been around since the early years of this century offering consumers advice, listening to their concerns, and helping them resolve problems. The files maintained by these organizations reflect the experiences of millions of consumers, and are therefore invaluable sources of information on a firm's performance and reliability.

EVALUATING YOUR OPTIONS

The recommendations received from colleagues and user or consumer advocacy groups are helpful when available. However, it is important to realize that not everyone shares the same experiences, and the purchase decision should not be based solely on this factor. Every mail order user needs to establish his/her own criteria for choosing companies. In our library we have created a very simple checklist that clearly illustrates the difference between companies (see Figure 2). The form is not elaborate and can be completed with a relatively short telephone call to the perspective firm. Although most of the questions are routine and straight-forward, there are some which require fuller explanations.

PRICE: Since price is one of the major determining factors in buying a product, it is important to get a clear idea of what the total price of that item will be. The "bargain-basement" price highlighted in an advertisement may seem attractive, but when all the additional charges are figured in (i.e., shipping, handling, and/or processing) the mail order advantage may have diminished greatly. Ask the salesperson to itemize all charges.

RETURNS: What happens when you purchase something that you can not use? Most mail order firms allow for returns within a certain period of time, usually 10-30 days. Some companies however, require the purchaser to pay

a re-stocking fee for putting that product back on the shelf.

In addition to fees, check to see if there are any restrictions on what items may be returned. Problems with piracy have led many companies to prohibit software returns.

DELIVERY: When placing an order, be sure to request an anticipated delivery date. Do not accept a vague or noncommittal response. If the salesperson is unable to offer a reasonable date, provide one for him/her. If your date is unacceptable to the company and no other time can be agreed upon, then take your business to another company. Time is money.

METHOD OF PAYMENT: Try to order products using an institutional purchase order. This method of payment allows the greatest control over the transaction, and usually identifies a reliable company. With a purchase order you do not pay until the merchandise is received. Therefore, firms have a strong incentive to see that your order is completed expeditiously.

If you can not use a purchase order, investigate all other available methods. Paying by check often requires a three to four week waiting period before the order will be even processed, and offers little leverage in the case of problems. Credit cards are fast, convenient, and provide a mechanism for refusing payment. However, many mail order companies charge their customers a premium on credit card purchases. This is especially true for "prestige" cards (i.e., American Express, Carte Blanche, and Diner's Club).

CUSTOMER SERVICE: If there is any absolute in mail order shopping, it is: never do business with any company that does not provide a telephone number for customer service. Do not even waste your time looking at their advertisements. Customer service is a basic and essential component of any reputable firm. However, a telephone number is just the beginning, and it is necessary to check the quality of the service itself. This can be accomplished rather easily by making a few "exploratory" calls. If you find that you are constantly receiving busy signals, or are being put on hold for extended periods of time, then it is wise to take your business elsewhere.

NAME: Of all the questions asked on the evaluation form, this is potentially the most important. There is nothing better than returning a problem directly back to its point of origin. The salesperson that originally took your order has a vested interest in seeing that you remain a "happy" customer. Do not be shy in asking for a full name, it could save you hours of frustration.

SOME PERSONAL FAVORITES

As a frequent mail order user I have developed some fairly strong preferences for companies and their products. The firms listed below are my personal favorites. It is important to remember that this list is the opinion of *one* person, and is not an unconditional endorsement of each company.

BCE
3832 S. Four Mile Run Drive
Department 1212
Arlington, VA 22206
800/221-3700

Bulldog Computer Products
3241 E Washington Road
Martinez, GA 30907
800/438-6039

Compuclassics
6934 Canby Street, Suite 109-110
Reseda, CA 94710
800/328-4473

PC Connection
6 Mill Street
Marlow, NH 03456
800/243-8088

Tussey Computer Products
P.O. Box 1006
State College, PA 16804
800/468-9044

Whole Earth Electronics
2990 7th Street
Berkeley, CA 94710
800/328-4473

A FINAL WORD

Mail order is a viable and economical means for obtaining hardware and software. Learning to deal with the market and preparing yourself for the process are all that are required to meet with success. The mail order market to a greater degree than conventional retail, requires us to become informed consumers. We need to understand the problems associated with mail order, and develop ways of coping with them. Do your homework and do not take anything for granted. Evaluate products before you purchase them. Read reviews, communicate with other users, and carefully investigate product guarantees and technical support mechanisms. Simply put, know your needs, your system requirements, the product you are purchasing, and the company with whom you will be dealing.

REFERENCE

[1] Chester, Jeff. "What's Wrong With Mail Order?." *MACWORLD*, December 1987): pp. 82-89.

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FIGURE 1

PRICE COMPARISON OF COMPUTER SYSTEMS

	Local Computer Store	Mail Order
Leading Edge Model "D" (1 floppy, 20MB)	$1,695	$1,195
Hayes 1200B modem (w/Smartcom)	350	299
Epson FX-286e Printer	625	439
WordPerfect 4.2	445	199
R:BASE System V	630	429
Lotus 1-2-3	445	309
TOTALS	$4,190	$2,870

TOTAL SAVINGS: $1,320

FIGURE 2

PRODUCT EVALUATION FORM FOR PURCHASING PRODUCTS BY MAIL

PRODUCT: _____
MANUFACTURER: _____
SUGGESTED RETAIL PRICE: _____

	COMPANY #1	COMPANY #2	COMPANY #3
PRICE:			
S/H:			
TOTAL:			
RETURNS:			
Restocking fee:			
Software:			
Hardware:			
IN STOCK: [Y/N]			
DELIVERY TIME:			
ACCEPT PURCHASE ORDER [Y/N]			
CUSTOMER SERVICE NUMBER:			
TECHNICAL SERVICE NUMBER:			
NAME OF SALESPERSON:			

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HOW TO DOWNLOAD AND USE PROCOMM—COMMUNICATIONS SOFTWARE WITH POWER PERFORMANCE AND PRICE

by Stephen Clancy
Biomedical Library
University of California, Irvine

Editor's Note: ProComm's popularity among online users continues to grow. Currently 27,000 registered copies are in use with 3000 copies being registered monthly. Two articles in this issue provide information for new as well as seasoned ProComm users. Clancy's article describes how to download and use ProComm. He provides examples of how to program ProComm for use with search services and electronic mail systems. He identifies bulletin board systems that house additional support files and programs. Lazewski and Sessions outline a step-by-step process for using ProComm's macros for creating offline search strategies to save online time. —Helen Gordon

The ProComm communications software for the IBM PC and compatibles was first released in July, 1985 under the name TERMULATOR. The next version (in August, 1985), was renamed to ProComm.

ProComm, the brainchild of Bruce Barkelew and Tom Smith, was distributed by PIL Software Systems (now known as Datastorm Technologies, Inc.). It was born into a world where venerable shareware products such as Andrew Fluegelman's PC-TALK III held sway. It first seemed to be a well-kept secret among a few microcomputer hobbyists and users of online bulletin board systems (BBS), but has since become better established. Presently, though still a favorite of BBS users, Datastorm estimates that 70 to 75 percent of ProComm's use is in the business, government and educational sectors.

Use of ProComm has spread worldwide. Approximately 27,000 copies are currently registered, not including those which are used under an unlimited licensing agreement. ProComm claims users on every continent except Antarctica; it has been well received in Scandinavia, Europe and England.

From its beginnings, ProComm has been a copyrighted, shareware product. It is NOT public domain, a common misconception, but its authors grant "non-registered users a limited license to use ProComm on a trial basis for the purpose of determining whether ProComm is suitable for their needs." If it is then used on a regular basis, registration is requested by sending $25 to Datastorm Technologies. This is a pittance for such a powerful program. Commercial programs of equal (or lesser!) standing can cost from twice to four times as much. Through this type of financial support, ProComm and other high-quality programs distributed under the shareware concept continue to be available.

The shareware concept has worked well for Datastorm. Though much of their business is done on a contract basis, thousands of individual users have registered voluntarily. Of the approximately 3000 copies of ProComm which are registered each month, about 1000 of these are from individual, non-commercial users! The idea of "share" ware is unique to the microcomputer age, and put simply, describes software which is distributed on a "pay-if-you-use" basis. As opposed to much commercial software which often carry disclaimers regarding quality and performance, most shareware is distributed on the STRENGTH of its

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quality and performance, asking users to send money and register with the authors if they like and intend to use the program regularly.

One reason for its success is ProComm's simplicity of operation for new users, while retaining many levels of complexity for the more experienced. ProComm is extremely flexible, much of its operation being open to user modification.

Some of the program's major features include:

- a dialing directory of up to 100 numbers
- automatic redial capability
- ten file transfer protocols
- ten terminal emulations
- keyboard macros
- timed, unattended operation and file transfer
- DOS gateway
- disk file and printer logging
- extensive "command" language.

ProComm requires at least 130K of RAM to operate, and will run under PC or MS-DOS on an IBM PC, XT, AT, or any close compatible. It can be used with a color, composite, or monochrome display. The default settings of the program allow it to work with any Hayes-compatible modem, but it is sufficiently flexible to work with others as well.

The manual is fairly complex, going into extensive detail on each function of the program. It contains an excellent index and table of contents.

If the program is obtained from another user, or from one of probably several hundred bulletin board systems, the manual will be in the form of a large text file (approx. 280K-330K depending on format) to be printed out at one's own printer. This document file is usually available in two formats: one which is formatted for most impact printers (e.g., Epson, Toshiba, IBM, etc.): and, a second which is unformatted for laser printers.

To receive a copy of the "bound" manual, registration with Datastorm at the $50 level (known as THE WORKS!) is required.

RUNNING THE PROGRAM

The main program file is PROCOMM.EXE. Typing **PROCOMM** and pressing the carriage return will begin the program. The first time that it is run, ProComm creates several files to be used in operation, including

PROCOMM.PRM – the default parameters
PROCOMM.DIR – the dialing directory
PROCOMM.KEY – the keyboard macros
PROCOMM.XLT – the translate table

The first 30 times or so that ProComm is loaded, an advertisement will display on the screen requesting that users register the program with Datastorm. Pressing any key will move the user into terminal mode.

FIGURE 1 is an example of the terminal mode screen. The status line at the bottom of the screen is present at all times and indicates current program settings. From left to right the status line displays:

ALT-F10	**– a reminder of how to display the HELP screen**
ANSI-BBS	**– the current terminal emmulation**
FDX	**– duplex setting, FULL or HALF DUPLEX**
2400 E71	**– current baud rate, parity, databits, stop bit**
LOG CLOSED	**– status of the "LOG" file, OPEN or CLOSED**
PRT OFF	**– status of the printer, ON or OFF**
CR	**– The last two parameters indicate whether line feeds are added to incoming and/or outgoing carriage returns.**

FUNCTIONS

As mentioned earlier, ProComm is simple to operate for the new user, yet is versatile enough for the experienced. It requires very little setup for use in most cases, but can be extensively modified for special situations.

Virtually every function in ProComm is accessed from terminal mode by pressing and holding the ALT key on the keyboard while pressing another key. For example, the HELP menu is available by pressing the ALT then the F10 key. The HELP menu (FIGURE 2) appears in a "window" which overlaps the current screen, as do many ProComm menus, and lists all major functions. This menu is extremely useful. Many users can, with a modicum of assistance, learn the basics of the program without ever referring to the manual. All windows can be exited by pressing the Esc key.

Major functions of interest to online searchers will be covered below, but following is a brief overview of HELP screen functions:

DIALING DIRECTORY – List of telephone numbers with communications settings.

AUTOMATIC REDIAL – Redial of one or more numbers in a queue.

KEYBOARD MACROS – Setup for user-defined keyboard macro strings.

LINE SETTINGS – Communication default settings.

TRANSLATE TABLE – User-defined translation of ASCII codes.

EDITOR – Invokes user-defined editor or word-processor.

EXIT – Exits ProComm and disconnects the line.

HOST MODE – Allows remote access to computer through ProComm.

CHAT MODE – Provides split-screen operation for online conversations.

DOS GATEWAY – Allows temporary exit to DOS without ending online session.

COMMAND FILES – User constructed programs using ProComm's command language.

REDISPLAY – Redisplay of last 10,000 characters.

PROGRAM INFO – Advertisement for ProComm.

SETUP SCREEN – Set-up for major user-configurable options.

KERMIT SERVER CMD – Standard server commands for use with remote Kermit servers.

CHANGE DIRECTORY – Change current DOS directory.

CLEAR SCREEN – Clears the screen in terminal mode.

TOGGLE DUPLEX – Toggles between FULL and HALF duplex.

HANG UP PHONE – Disconnects the line.

ELAPSED TIME – Current date and time as well as elapsed time online.

PRINT ON/OFF – Toggles printer ON and OFF.

SET COLORS – User-definable colors for ProComm screens.

AUTO ANSWER – Sets modem into auto-answer mode.

TOGGLE CR-CR/LF – Option to add a line feed character to incoming lines.

BREAK KEY – Sends a standard break signal.

SEND FILES – Upload file(s) using ASCII or error-checking protocols.

RECEIVE FILES – Download file(s) using ASCII or error-checking protocols.

DIRECTORY – File listing of currently logged drive/sub-directory.

VIEW A FILE – Display a text file on the screen.

SCREEN DUMP – Saves current screen to a DOS file on disk.

LOG TOGGLE – Open/close a file on disk for capture of online TEXT.

LOG HOLD – Suspend capture of online text without closing the file.

PROGRAM CUSTOMIZATION (SETUP SCREENS)

Communication settings are fully configurable with ProComm. The program default setting is 300 baud, 8 data bits, 1 stop bit, no parity, and full duplex. This can be reset by the user at the LINE SETTINGS window which is displayed by using the ALT-P command. Baud rates from 300-19200, and up to four COM ports are supported (FIGURE 3).

ALT-S will bring up the main SETUP menu (FIGURE 4). Through this the user is able to configure almost any feature of the ProComm program including modem parameters, terminal emulations, screen colors, and sound effects (yes, ProComm DOES have sound effects!).

DIALING DIRECTORY

The dialing directory is displayed by pressing ALT-D (FIGURE 5). In the current version up to 100 entries are possible. For each, the name, telephone number, and settings (e.g., baud rate, parity, duplex) are displayed and may be scanned page by page using the PgDn/PgUp keys or line by line using the up and down arrows of the keyboard.

Entries are easily added, and may be removed individually or en masse. Communication parameters such as baud rate, parity, databits (word length), stop bits, and duplex are set for each directory entry allowing maximum flexibility. When accessing commercial online systems, such as BRS or DIALOG, involving the transfer of alphanumeric data without the use of error-checking protocols, settings of EVEN PARITY, 7 DATABITS, and 1 STOP BIT are appropriate. For communications where an error-checking protocol such as XMODEM is used to transfer data (e.g., BBS's) NO PARITY (or NONE), 8 DATABITS, and 1 STOP BIT is preferred.

Entries are dialed by typing the entry number at the ==> prompt, and pressing the return key (FIGURE 5). As with each window display, the dialing directory is exited by pressing the ESC key.

Special codes for access to long distance carriers, or for dialing through an office PBX or switchboard can precede or follow an entry number when dialing. Up to four of these "LD" codes can be stored in the system, and accessed by using the symbols –, +, @, or #.

For example, to call long distance using a carrier such as Sprint, one would choose the # option at the directory menu, then select the "LD" code to change such as @. The @ LD code is set to "123-4567,,,99999," where "123-4567" is the local Sprint telephone number, and "99999" is the private Sprint account ID. The commas tell ProComm to pause (one second each) between sending the numbers. To dial entry 1 in FIGURE 5 using Sprint, one would now type @1 at the ==> prompt.

One or more numbers can be redialed in a ►

"circular" dialing-queue using ALT-R. A sequence of five numbers, for instance, can be dialed and redialed automatically until a connection is made with one of them (FIGURE 6). This is especially useful when trying to reach constantly busy numbers.

KEYBOARD MACROS

(Note: See also the accompanying article Macros on ProComm for Online Searching *by Lazewski and Sessions.)*

Keyboard "macros" are alphanumeric strings which can be assigned to the keys ALT-0 through ALT-9 in ProComm. This feature allows the transmission of the desired string to the remote computer at will, or from within a command file. A common use of macros is the storage of oft repeated key sequences. FIGURE 7 is an example of several macros used by the author.

ALT-0 and ALT-1 have the strings

"TS (LA) :ENG:!" and "TS (LA) :ENG: AND :HUMAN: (MH)!"

assigned to them. These are used on the National Library of Medicine's MEDLARS system to limit a search to either English language, or English language and "human" indexed articles respectively. A similar sequence is seen for ALT-2 and ALT-3 to perform the same functions on BRS' **MeSH (MEDLINE)** database. The symbol ! corresponds to a carriage return.

The sequence assigned to ALT-5 is used to initiate a speed dialing routine on our campus-wide phone system. The asterisk * symbol corresponds to the same symbol on the button pad of the phone. The ~ symbol indicates a pause between the characters sent to the modem.

ALT-6 through ALT-9 are examples of macros used to send other command sequences to the modem.

Macro strings may be up to 50 characters long and contain imbedded control codes, escape sequences, and carriage returns.

ALT-M will display the macro set-up window from terminal mode. At this point, one can add or revise (**R**), save (**S**), and clear (**C**) a macro.

The default filename to store macros is "PROCOMM.KEY" but other names can be used as well. The **L** (load) function can be used to access alternate macro files, making the number of keyboard macros available virtually limitless.

Multiple macro files give the user a great deal of flexibility and can automate many functions when using online systems. They can be accessed from within a command file which in turn can be linked with one or more numbers in the dialing directory. In the example below, the macro file CISMACRO.KEY which contains a user ID# and password, has been linked with a command file to automate logon and electronic mail retrieval on the CompuServe Consumer Information Service.

```
; Logon and email check for CompuServe.
IF CONNECTED
    TRANSMIT "^C"          ; When online, send Control-C.
ENDIF
MLOAD "CISMACRO.KEY"       ; Load CompuServe macro set.
WAITFOR "User ID:"
    MACRO 0                ; Send macro #0 containing user id.
WAITFOR "Password:"
    MACRO 1                ; Send macro #1 containing pass-
                           word.
PRINTER ON                 ; Turn on the printer.
WAITFOR "EasyPlex"
IF WAITFOR                 ; If there is mail print it out.
ELSE                       ; If there is no new mail, go to
    GOTO NOMAIL            ; the Label NOMAIL.
ENDIF
WAITFOR "Enter choice"
    TRANSMIT "0!"
LAST:
WAITFOR "Last page." 360   ; At the end of the messages,
IF WAITFOR
    TRANSMIT "DELETE!"     ; delete them all.
ENDIF
WAITFOR "No mail waiting"  10
IF WAITFOR
    GOTO LOGOFF
ELSE
    GOTO LAST
ENDIF
NOMAIL:
MESSAGE "*****SORRY, NO MAIL TODAY!*****"
LOGOFF:                    ; Logoff sequence.
TRANSMIT "BYE!"            ; End the session.
WAITFOR "Connect time"
PRINTER OFF                ; Turn the printer off.
```

Command files are discussed further below.

DATA CAPTURE

Using ProComm to capture all or part of an online session is particularly straightforward. If the user wishes merely to create a hardcopy record of the online session, the ALT-L command can be used to toggle the printer on and off. If, instead, the user chooses to save the session in a disk file, this is done by opening a file using the ALT-F1 key combination. A small window will open over the current screen and request a filename. If none is given, the default name of "PROCOMM.LOG" is used. The status of this file is also noted at the bottom of the

screen. While "open," all data displayed on the screen is saved in the file. The file may also be put "on hold" at will using ALT-F2, which means that input into the file is temporarily suspended. This is particularly useful for online searching where the searcher may only want the results of a search saved, but not the strategy (along with any mistakes!). Pressing ALT-F1 again will close the file. Unless specified, any file created in this manner will be saved in the current directory, but may also be created in a different subdirectory by either specifying it as part of the filename, or by using the ALT-B command to change the logged directory and/or drive.

ALT-F6 activates the redisplay feature, which allows the user to scroll back through the last several "pages" of display. Redisplay is of the last 10,000 characters, and may be scrolled "up" or "down" using the **PgUp** and **PgDn** and **up/down arrow** keys. This is a useful alternative to redisplaying a search strategy online, especially on systems such as MEDLARS which charge per character.

For those online systems which will respond (e.g., DIALOG), a break signal may be sent by using the CTRL-BREAK, or ALT-F7 keys to interrupt processing or printing.

FILE TRANSFER

The transfer of files from one computer to another can be done with or without the use of error-checking protocols to ensure accuracy. Both uploading (transfer of a file *TO* the remote system) and downloading (transfer *FROM* the remote system) functions are invoked by pressing the **PgUp** or **PgDn** keys respectively. The current version supports the following transfer protocols:

- XMODEM (checksum, CRC, or "relaxed")
- KERMIT
- TELINK
- MODEM7
- YMODEM
- YMODEM Batch
- ASCII
- COMPUSERVE B
- WXMODEM

All of the protocols, with the exception of ASCII, perform an error-checking function during file transfer, and are generally supported only by BBSs and some commercial systems such as CompuServe. They are suitable for the error-free transfer of text and binary files. ASCII transfer involves the straight transfer of a file (generally text) without error correction. This is most useful with certain electronic mail systems such as OnTyme and DIALMAIL. The user is able to compose a text file offline using a word processor (which produces an ASCII file), and can then upload it to the host system using the ASCII option.

For online searching, however, use the file logging procedure as described above.

TERMINAL EMULATION

ProComm has the ability to emulate several terminal types, including:

- VT-100/VT-102
- IBM 3101
- TELEVIDEO 900 SERIES
- DEC VT-52
- LEAR SIEGLAR ADM 3/5
- HEALTH/ZENITH 19
- ADDS VIEWPOINT
- WYSE 100
- ANSI-BBS

In some cases, not all features of a particular terminal type are emulated.

The default emulation is ANSI-BBS, which uses the VT-100 standard keyboard mapping, but processes DOS ANSI codes in the same manner as the DOS ANSI.SYS device driver. This enables ProComm to display the graphics and color displays that are used by many IBM-based BBSs. It also works well for communications with most commercial online systems.

COMMAND LANGUAGE

ProComm's command language is one of its most powerful features and functions as an actual programming language, albeit a simple one. Command files consist of a series of ProComm's powerful commands, organized in such a way as to provide automatic logon routines to remote hosts and to provide other tasks while online.

CREATING A COMMAND FILE

A command file is a text file that can be created using any word processor that has the capability of saving the document as an ASCII file. The command files in this article were created using both WordPerfect and PC-Write.

Command files can be executed in a variety of ways. Individual command files can be linked with entries in the dialing directory (see FIGURE 5) and will execute when the entry is dialed. Command files can also be executed at the DOS command line. For example,

```
A> PROCOMM /FBRS
```

would load ProComm, and execute the command file called BRS.CMD from the "A" drive of the computer.

The third method uses the ALT-F5 keys to open a window displaying a list of all available command files (FIGURE 8) which may then be selected using the cursor control keys. This

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method is best used for command programs which are needed on demand while using an online service. On the National Library of Medicine's MEDLARS system, the user is queried periodically **CONTINUE PRINTING? (YES/NO)** while displaying a list of references. The following command program illustrates one method of automatically answering this rather irritating feature:

```
START:
WAITFOR "(YES/NO)"      ; Wait for the string "(YES/NO)".
IF WAITFOR              ; When received, then
  TRANSMIT "$"          ; send "$" to delete any line noise,
  TRANSMIT "Y"          ; then answer "Y" to continue.
ELSE
  GOTO START            ; This is a continuous loop which
ENDIF                   ; can be ended at will be pressing
GOTO START              ; the ESC key.
```

At any point, an executing command file can be aborted by pressing the ESC key.

The manual gives adequate explanation of each command, but actual examples are rather sparse. However, fine examples of command language programming are available from many BBSs.

Examples provided at the end of this article illustrate how ProComm's command language can be used to construct a program to logon to an online host system. One example builds on a simple logon, supplying ID numbers, and passwords at the appropriate points, and adds checking for certain types of access problems. Further samples show logons to other systems via various networks.

TEF

Used in conjunction with a separate utility program named TEF (Timed Execution Facility), ProComm has the ability to "wake-up" at a preset time (on a 24 hour clock), and execute the contents of a pre-written command file.

This facility can be used to connect with online services late at night when rates may be lower. Practical uses could include running a "canned" search (e.g., a monthly current-awareness search), interlibrary loan request transfer, e-mail, and file transfer.

To use TEF, a command file must be constructed in advance. TEF may be used on a DOS command line in the format:

```
TEF [command_filename    time]
i.e. TEF COMPAUTO.CMD 23:45.
```

If "TEF" is entered alone, the user is prompted for the filename and time (FIGURE 9).

Unfortunately, there is currently no way to enter a DATE into the command line, so TEF can only be preset for the current 24-hour period.

Since all operation will be unattended when using TEF, it is important to include the DIAL command, and appropriate HANGUP and EXIT or QUIT commands in the command file. The command file example for CompuServe access above could be modified as follows to be used with the TEF:

```
DIAL "11"               ; added command to dial directory entry
                          #11
IF CONNECTED
TRANSMIT "^C"
ENDIF
.
.
.
MESSAGE "****SORRY, NO MAIL TODAY!****"
LOGOFF:
TRANSMIT "BYE!"
WAITFOR "Connect time"
PAUSE 10
PRINTER OFF
HANGUP                  ; added command to hang up the line.
QUIT                    ; added command to exit ProComm and
                          return to DOS.
```

HOW TO GET PROCOMM

If one has already obtained a copy of ProComm from some source, registration of the software is $25, payable directly to Datastorm. If not, ProComm can be obtained in a variety of ways.

It can be ordered directly from Datastorm for $35, which includes a diskette with the latest version and full registration, or $50, which includes the diskette and a bound manual. A demonstration copy can be obtained (no registration included) for $10.

Another common method of obtaining the software is to download it from one of various BBSs around the United States. A few have been designated as distributors and always carry the current version. See Appendix A for a list of these.

Datastorm also operates a bulletin board system which carries the current version, as well as many support files. Two separate lines are operated, one for registered, and one for non-registered users. Product support is usually provided via this BBS. Registered users are able to call the private dataline, and leave messages regarding any problems, questions, suggestions and experiences they have been having with ProComm. In addition, as on most bulletin board systems, other users are usually more than happy to help others with ProComm-related problems or applications.

SUPPORT FILES AND PROGRAMS

Due to its wide popularity, many users have contributed companion files and programs for ProComm, including examples of useful command language files. These programs are available from Datastorm's support BBS and from many other BBSs around the country.

The WELLSPRING BBS here at the Biomedical Library carries many excellent support programs. See Appendix B for a list of some of these.

ACKNOWLEDGMENT

The author wishes to thank Suzanne Lumpe, programmer for the U.C. Irvine Libraries, for her invaluable technical assistance, and contribution of the OCLC command files.

ProComm is a trademark of Datastorm Technologies, Inc.

PC-TALK III is a registered trademark of the Headlands Press, Inc.

PC-Write is a registered trademark of Quicksoft.

WordPerfect is a registered trademark of WordPerfect Corporation.

OCLC is a registered trademark of OCLC Online Computer Library Center, Inc.

BRS is a registered trademark of BRS Information Technologies.

DIALOG is a registered trademark of Dialog Information Services, Inc.

Telenet is a registered trademark of Telenet Communications Corporation.

TYMNET is a registered trademark of Tymnet McDonald Douglas, Inc.

DIALNET is a registered trademark of Dialog Information Services, Inc.

APPENDIX A

BBSs CARRYING CURRENT VERSION OF PROCOMM

Datastorm Technologies, Inc.
P.O. Box 1471
Columbia, MO 65205

NON–REGISTERED USER BBS:
314/449-9401 (as of 9/10/87. May change in future) 2400 baud, 24 hours a day

Computer Aide BBS
Mike Johnson, Sysop
Tulsa, OK. 918/493-2137
2400 baud, 24 hours a day

PConnecticut BBS
John O'Boyle, Sysop
West Hartford, CT. 203/521-1991
2400 baud, 24 hours a day

Underdog BBS
Sal Manaro, Sysop
Seattle, WA. 206/725-9233
2400 baud, 24 hours a day

WELLSPRING RBBS
Steve Clancy, Sysop
Irvine, CA 714/856-7996
2400 baud, 5pm-8am M-F,
24 hours weekends

ATL/FIDO1
Ken Shackelford, Sysop
Woodstock, GA. 404/928-1876
2400 baud, 24 hours a day

TBC BBS
Dave Staehlin, Sysop
Albuquerque, NM. 505/821-7379
2400 baud, 24 hours a day

Rowlett RBBS
Dan Kardell, Sysop
Rowlett, TX. 214/475-4598
2400 baud, 24 hours a day

IBM/PC SIG, The Source
Mike Todd, Sysop
The Source 800/336-3330 (voice)
Mike Todd 213/439-6104 (voice)

APPENDIX B

PROCOMM SUPPORT FILES AND PROGRAMS FROM WELLSPRING RBBS

APCP.ARC	Set of ProComm command files for PC-Pursuit.
CMDFILES.ARC	Sample command files for ProComm 2.4.

APPENDIX B (continued)
PROCOMM SUPPORT FILES AND PROGRAMS FROM WELLSPRING RBBS

DGDIRECT.ARC	Command file which contains complete settings to log onto a Data General system running AOS/VS.
MSPRCM23.ARC	PC-MOUSE driver for ProComm 2.3. Includes runnable .COM files and docs.
PCP-MENU.ARC	ProComm 2.4 CMD language file to dial PC-Pursuit numbers.
PCP-PAL.ARC	Extensive set of PC-Pursuit command files for ProComm 2.42.
PRC&MLNK.ARC	Using ProComm with Multilink.
PROCOMJR.ARC	Modem setup for PCJR using ProComm. Very good.
PROCUTIL.ARC	Utilities for ProComm. Includes 2.4+ command files. – TEF.EXE ver. 1.3 timed execution facility. – PRCMSORT.EXE V1.1 directory sorter.
PROHOST.TXT	How to set up Host mode in ProComm.
PROTEMP.ARC	Function key overlay for ProComm commands.
SEND.ARC	Automatically send e-mail to CompuServe using ProComm.
VA212A.ARC	Setup for the Vadic 212A modem using ProComm.

FIGURE 1
PROCOMM TERMINAL MODE

This is an example of the terminal mode screen. The status line at the bottom of the screen is present at all times and displays current program settings.

```
Dialing Telenet 2400

CONNECT 2400

TELENET
714  16A

TERMINAL=

@C  315208

ALT-F10 | HELP | ANSI-BBS | FDX | 2400  E71 | LOG  CLOSED | PRT  OFF | CR | CR
```

FIGURE 2
PROCOMM HELP SCREEN

The HELP menu appears in a "window" which overlaps the current screen.

```
                    P r o C o m m   H e l p

   MAJOR FUNCTIONS              UTILITY FUNCTIONS            FILE FUNCTIONS
Dialing Directory .....Alt-D  Program Info .....Alt-I   Send files .....PgUp
Automatic Redial ....Alt-R  Setup Screen .....Alt-S   Receive files .....PgDn
Keyboard Macros ....Alt-M  Kermit Server Cmd ..Alt-K  Directory .....Alt-F
Line Settings .....Alt-P  Change Directory ....Alt-B  View a File .....Alt-V
Translate Table .....Alt-W  Clear Screen .....Alt-C   Screen Dump .....Alt-G
Editor .....Alt-A  Toggle Duplex .....Alt-E  Log Toggle .....Alt-F1
Exit .....Alt-X  Hang Up Phone .....Alt-H  Log Hold .....Alt-F2
Host Mode .....Alt-Q  Elapsed Time .....Alt-T
Chat Mode .....Alt-O  Print On/Off .....Alt-L
DOS Gateway .....Alt-F4  Set Colors .....Alt-Z
Command Files .....Alt-F5  Auto Answer .....Alt-Y
Redisplay .....Alt-F6  Toggle CR-CR/LF ....Alt-F3
                       Break Key .....Alt-F7
```

FIGURE 3
LINE SETTINGS WINDOW

The LINE SETTINGS window can be displayed by using the ALT-P command. Baud rates range from 300 to 19,200 and four COM ports are supported.

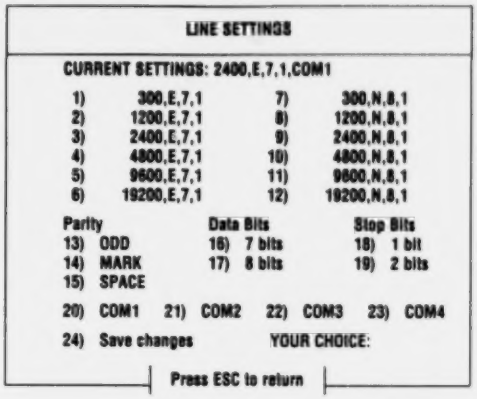


FIGURE 4
PROCOMM SETUP MENU

ALT-S will bring up the main SETUP menu. With this menu, the user is able to configure most features of the ProComm program.

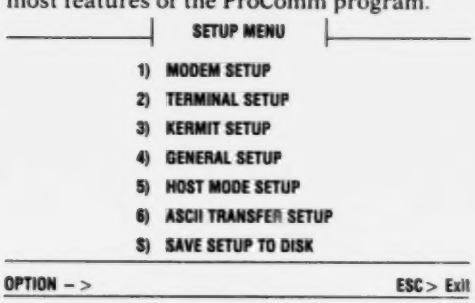


FIGURE 5
PROCOMM DIALING DIRECTORY

In the current ProComm version, 100 dialing entries are possible.

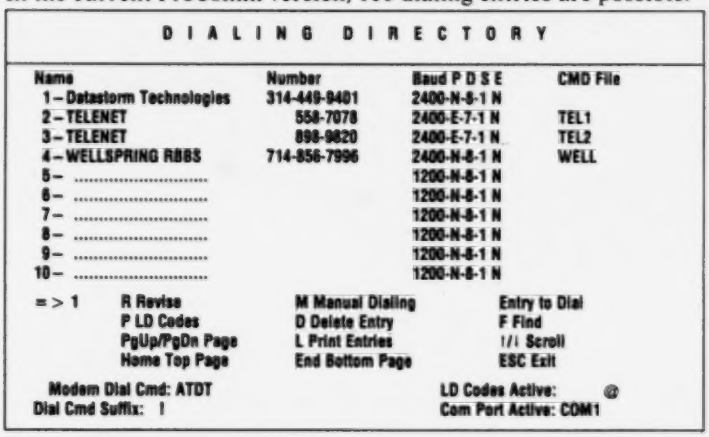

D I A L I N G D I R E C T O R Y
Name
Number
Baud P D S E
CMD File
1 – Datastorm Technologies 314-449-9401 2400-N-8-1 N
2 – TELENET 558-7078 2400-E-7-1 N TEL1
3 – TELENET 898-9820 2400-E-7-1 N TEL2
4 – WELLSPRING RBBS 714-856-7996 2400-N-8-1 N WELL
5 – ..... 1200-N-8-1 N
6 – ..... 1200-N-8-1 N
7 – ..... 1200-N-8-1 N
8 – ..... 1200-N-8-1 N
9 – ..... 1200-N-8-1 N
10 – ..... 1200-N-8-1 N
=> 1 R Revise
P LD Codes
PgUp/PgDn Page
Home Top Page
M Manual Dialing
D Delete Entry
L Print Entries
End Bottom Page
Entry to Dial
F Find
↑/↓ Scroll
ESC Exit
Modem Dial Cmd: ATDT
Dial Cmd Suffix: !
LD Codes Active: @
Com Port Active: COM1

FIGURE 6
REDIALING

A sequence of five numbers can be dialed and redialed automatically until a connection is made. This is especially useful when trying to reach constantly busy numbers.

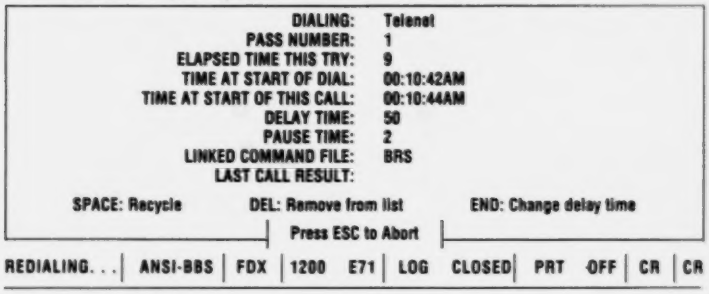
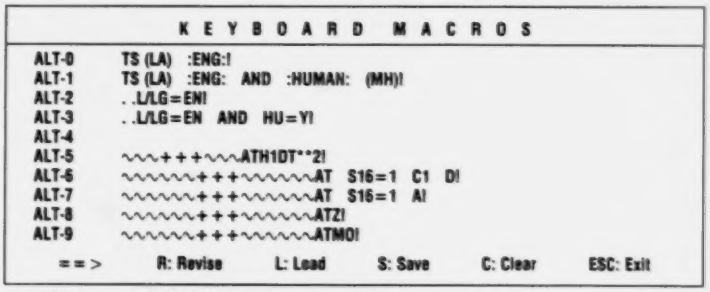

DIALING: Telenet
PASS NUMBER: 1
ELAPSED TIME THIS TRY: 9
TIME AT START OF DIAL: 00:10:42AM
TIME AT START OF THIS CALL: 00:10:44AM
DELAY TIME: 50
PAUSE TIME: 2
LINKED COMMAND FILE: BRS
LAST CALL RESULT:
SPACE: Recycle
DEL: Remove from list
END: Change delay time
Press ESC to Abort
REDIALING. . . | ANSI-BBS | FDX | 1200 E71 | LOG CLOSED | PRT OFF | CR | CR

FIGURE 7
KEYBOARD MACRO SETUP WINDOW

Keyboard "macros" are alphanumeric strings. This feature allows the transmission of the desired string to the remote computer.



ALT-0 = MEDLARS stringsearch for ENGLISH.
ALT-1 = MEDLARS stringsearch for ENGLISH and HUMAN.
ALT-2 = BRS limit command for ENGLISH in Medline.
ALT-3 = BRS limit command for ENGLISH and HUMAN in Medline.
ALT-5 = Speed dialing command on University phone system.
ALT-6 = Hayes 1200B modem originate mode self-test.
ALT-7 = Hayes 1200B modem answer mode self-test.
ALT-8 = Hayes 1200B modem initialization.
ALT-9 = Hayes 1200B modem speaker-off command.

FIGURE 8
COMMAND FILE WINDOW

This window displays a list of all available command files which may be selected using the cursor control keys. This method is best used for command programs which are needed on demand while using an online service.

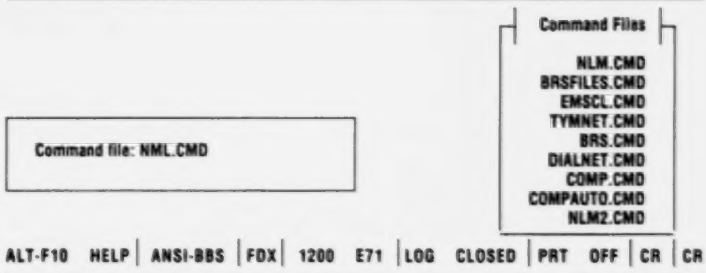


FIGURE 9

TIMED EXECUTION FACILITY

Used in conjunction with a separate utility program (TEF), ProComm has the ability to "wake up" at a preset time and execute the contents of a pre-written command file.

Usage of the program is

TEF [command_ filename time]

i.e., **TEF COMPAUTO.CMD 23:45**

The command file name and time are optional, you may enter the command "TEF" along for interactive use as below.

(1st screen)

```
ProComm Timed Execution Facility V1.3
Enter name of command file to execute: COMPAUTO
Enter hour to start execution (0-23): 23
Enter minute to start execution (0-59): 45
                                Press ESC to abort
```

(2nd screen)

```
Awaiting execution of ProComm command file: COMPAUTO.CMD
Current time: 15:38:29.  Execution time: 23:45:00.
Press ESC to abort. Press F1 to change. Press F2 to clear the screen.
```

BASICS OF COMMAND FILES:

The following three command file programs are examples of a logon routine to OCLC via telephone dial-up through the CompuServe Network Services network. They illustrate many common routines, including the use of logical branching statements. Of course, for actual use, each program would need to be individualized with appropriate telephone access numbers, id codes, and passwords.

EXAMPLE 1

The first example is a straightforward logon routine to OCLC, going through CompuServe. Commands utilized in this routine are as follows:

MESSAGE "your message"	Displays on the screen what is between the double quotes.
TRANSMIT "to remote system"	Send what is between the double quotes to the remote system, as though you had typed it yourself via the keyboard.
WAITFOR "string" time	Wait for a response back from the ►

remote system and make sure that it matches the string between the double quotes. If desired, you can specify a number for "time" and it will wait that number of seconds before going on (the default is 30 seconds).

PAUSE time — Stop command file execution for a certain number of seconds (time).

; — Comments (words that are not recognized by the command file) can be placed anywhere after the semicolon.

! — Signifies a carriage return (carriage return translation character).

~ — Causes a pause in characters being sent to the modem (pause translation character). Each ~ is equivalent to a pause of 1/2 second.

```
;
;                              OCLC1.CMD
;
; Written by Suzanne Lumpe
;
; This routine provides a logon sequence to OCLC through CompuServe, and the
; basics of ProComm command language are exhibited.  This routine has all
; the necessary information available to it before the logon takes place
; (i.e., UIC number, password, and id number).
;
; This command file is executed at the DOS prompt by typing in
;
;                  PROCOMM /FOCLC1.CMD
;
; and following this with a carriage return.
;

EMULATE VT100                  ; Set terminal emulation
SET PORT COM1                  ; Set the port where the modem resides
SET BAUDRATE 1200              ; These next 5 statements set the necessary
SET PARITY EVEN                ; communications parameters so "talking" can
SET DATABITS 7                 ; take place correctly between the PC and the
SET STOPBITS 1                 ; remote system
SET DUPLEX FULL                ;
HANGUP                         ; Disconnect the phone before sending anything
                               ; just in case there is previous garbage on the
                               ; line
MESSAGE "ATTEMPTING TO ACCESS OCLC (Compuserve) ...."
TRANSMIT "ATDT 98518145!"      ; Send phone number through modem followed
                               ; by a carriage return (!)
PAUSE 25                       ; Allow time for connection
TRANSMIT "~~~~~~~~~~!"         ; Allow pauses before characters are sent to the
                               ; modem
```

EXAMPLE 1 (continued)

```
WAITFOR "Host Name:"          ; Wait the default of 30 seconds for this from
                              ; remote system
TRANSMIT "OCLC!"              ; Send the name of where you want to go
                              ; followed by a carriage return
WAITFOR "UIC:"                ; Wait the default of 30 seconds for this from
                              ; remote system
TRANSMIT "YOURUIC!"           ; Send your UIC number followed by a
                              ; carriage return
WAITFOR "Password:" 60        ; Wait 60 seconds for this from remote system
TRANSMIT "YOURPASSWORD!"      ; Send your password followed by a carriage
                              ; return
WAITFOR "Please log on" 60    ; Wait 60 seconds for this from remote system
TRANSMIT "IDNUMBER^C"         ; Send your ID number for OCLC followed by
                              ; a CTRL-C (^C)

; End of routine.  If all has gone well, you should be on OCLC.
```

EXAMPLE 2

This example is still a logon routine to OCLC via CompuServe, but now error checking has been incorporated. Error checking is important so that users can be alerted when there are problems and so command file execution will not continue blindly when there are problems.

New commands used in this routine:

If NOT condition do these statements	Command used to make decisions. If the condition is not true, do the following.
ENDIF	Statements, up to the ENDIF. If the condition is true, don't do the statements and instead go to the next command following the ENDIF.
GOTO label	Jump from wherever you are in the command file to this label and do all statements following this label.

```
;
;                         OCLC2.CMD
;
; Written by Suzanne Lumpe
;
; This routine provides a logon sequence to OCLC and also provides some
; error checking in case there is no connection to the host or if the
; host is not responding the way it is expected.  The GOTO command is
; exhibited.
;
; This command file is executed by typing at the DOS prompt
;
;                         PROCOMM /FOCLC2.CMD
;
```

EXAMPLE 2 (continued)

```
; and following this with a carriage return.
;

EMULATE VT100                   ; Set terminal emulation
SET PORT COM1                   ; Set the port where the modem resides
SET BAUDRATE 1200               ; These next 5 statements set the necessary
SET PARITY EVEN                 ; communications parameters so "talking" can
SET DATABITS 7                  ; take place correctly between the PC and the
SET STOPBITS 1                  ; remote system
SET DUPLEX FULL                 ;
HANGUP                          ; Disconnect the phone before sending anything
                                ; just in case there is previous garbage on the
                                ; line
MESSAGE "ATTEMPTING TO ACCESS OCLC (Compuserve) ...."
TRANSMIT "ATDT 9851814S!"       ; Send phone number through modem followed
                                ; by a carriage return (!)
PAUSE 25                        ; Allow time for connection
IF NOT CONNECTED                ; If you can't be connected, goto the routine
  GOTO PROBLEMS                 ; PROBLEMS, inform the user of this,
ENDIF                           ; disconnect the modem, and quit ProComm
TRANSMIT "~~~~~~~~~:"           ; Allow pauses before characters are sent to the
                                ; modem
WAITFOR "Host Name:"            ; Wait the default of 30 seconds for this from
                                ; remote system
IF NOT WAITFOR                  ; If remote system did not send this, terminate
  GOTO PROBLEMS                 ; command file with error messages
ENDIF
TRANSMIT "OCLC!"                ; Send the name of where you want to go
                                ; followed by a carriage return
WAITFOR "UIC:"                  ; Wait the default of 30 seconds for this from
                                ; remote system
IF NOT WAITFOR                  ; If the remote system did not send this,
  GOTO PROBLEMS                 ; terminate command file with error messages
ENDIF
TRANSMIT "YOURUIC!"             ; Send your UIC number followed by a
                                ; carriage return
WAITFOR "Password:" 60          ; Wait 60 seconds for this from remote system
IF NOT WAITFOR                  ; If the remote system did not send this,
  GOTO PROBLEMS                 ; terminate command file with error messages
ENDIF
TRANSMIT "YOURPASSWORD!"        ; Send your password followed by a carriage
                                ; return
WAITFOR "Please log on" 60      ; Wait 60 seconds for this from remote system
IF NOT WAITFOR                  ; If the remote system did not send this,
  GOTO PROBLEMS                 ; terminate command file with error messages
ENDIF
TRANSMIT "IDNUMBER^C"           ; Send your ID number for OCLC followed by
                                ; a CTRL-C (^C)
GOTO END                        ; At this point, you should be on OCLC; goto the
```

EXAMPLE 2 (continued)

```
                              ; label END so as not to fall into the PROBLEMS
                              ; routine which is next

PROBLEMS:                     ; Start of PROBLEMS routine
  ALARM 1                     ; Sound beep to alert user of problem
  CLEAR                       ; Clear the screen
  LOCATE 10,20                ; Locate cursor position on screen
  MESSAGE "****** PROBLEMS ACCESSING OCLC!! ******"
  ; Double exclamation points ('!') ensures a real ! will be sent, and
  ; NOT a carriage return
  LOCATE 12,20
  MESSAGE "PLEASE TRY AGAIN LATER!!"
  LOCATE 14,26
  MESSAGE "EXITING ...."
  PAUSE 7                     ; Pause 7 seconds so users have time to
                              ; read error messages
  HANGUP                      ; Disconnect modem
  QUIT                        ; Exit ProComm

END:                          ; If the routine jumped around the PROBLEMS
                              ; routine to this label, then you are
                              ; successfully on OCLC
```

EXAMPLE 3

This example illustrates how a command file can accept user input from the keyboard at any point in the file and how this user input can be sent to the remote system. The use of subroutines is also illustrated. Subroutines are very useful if there is a certain set of commands you wish to execute from different points in the program, always returning back to the next command in that point of the program.

New commands in this routine:

GOSUB label	Jump from wherever you are in the command file to this label, perform the statements following this label, and, upon encountering a RETURN command, return to the statement in the command file following this GOSUB command.
MGET	Get user input and mask it (so only *'s will show up on the screen and not what the user is typing).
S0-S9	String variable provided by ProComm; user input can be put into any of these variables.

```
;
;
;                             OCLC3.CMD
;
; Written by Suzanne Lumpe
;
```

EXAMPLE 3 (continued)

```
; This routine provides a logon sequence to OCLC, provides error checking,
; and demonstrates how a subroutine works (in this case, for user input of
; a password).
;
; This command file is executed at the DOS prompt by typing in
;
;                          PROCOMM /FOCLC3.CMD
;
; and following this with a carriage return.
;


EMULATE VT100               ; Set terminal emulation
SET PORT COM1               ; Set the port where the modem resides
SET BAUDRATE 1200           ; These next 5 statements set the necessary
SET PARITY EVEN             ; communications parameters so "talking" can
SET DATABITS 7              ; take place correctly between the PC and the
SET STOPBITS 1              ; remote system
SET DUPLEX FULL             ;
HANGUP                      ; Disconnect the phone before sending anything
                            ; just in case there is previous garbage on the
                            ; line
MESSAGE "ATTEMPTING TO ACCESS OCLC (Compuserve) ...."
TRANSMIT "ATDT 9851@145^M"  ; Send phone number through modem followed
                            ; by a carriage return (^M)
PAUSE 25                    ; Allow time for connection
IF NOT CONNECTED            ; If you can't be connected, goto the routine
  GOTO PROBLEMS             ; PROBLEMS, inform the user of this,
ENDIF                       ; disconnect the modem, and quit ProComm
TRANSMIT "^^^^^^^^^"        ; Allow pauses before characters are sent to the
                            ; modem
WAITFOR "Host Name:"        ; Wait the default of 30 seconds for this from
                            ; remote system
IF NOT WAITFOR              ; If remote system did not send this, terminate
  GOTO PROBLEMS             ; command file with error messages
ENDIF
TRANSMIT "OCLC^M"           ; Send the name of where you want to go
                            ; followed by a carriage return
WAITFOR "UIC:"              ; Wait the default of 30 seconds for this from
                            ; remote system
IF NOT WAITFOR              ; If remote system did not send this, terminate
  GOTO PROBLEMS             ; command file with error messages
ENDIF
TRANSMIT "YOURUIC^M"
WAITFOR "Password:" 60      ; Wait 60 seconds for this from remote system
IF NOT WAITFOR              ; If the remote system did not send this,
  GOTO PROBLEMS             ; terminate command file with error messages
ENDIF
```

EXAMPLE 3 (continued)

```
GOSUB GETPWORD                  ; Go to the subroutine GETPWORD
WAITFOR "Please log on" 60      ; Wait 60 seconds for this from remote system
IF NOT WAITFOR                  ; If the remote system did not send this,
  GOTO PROBLEMS                 ; terminate command file with error messages
ENDIF
TRANSMIT "IDNUMBER^C"           ; Send your ID number for OCLC followed by
                                ; a CTRL-C (^C)
GOTO END                        ; At this point, you should be on OCLC; goto the
                                ; the label END so as not to fall into the
                                ; GETPWORD subroutine which is next

GETPWORD:                       ; Start of routine to get the user's password
  CLEAR                         ; Clear the screen
  LOCATE 2,5                    ; Locate cursor position
  MESSAGE "WHAT IS YOUR PASSWORD? "
  LOCATE 4,5
  MESSAGE "(Please follow answer with a carriage return)"
  LOCATE 2,30
  MGET $0                       ; Get the user's password and MASK it (i.e.,
                                ; only show *'s on the screen when the user
                                ; is typing it).  Put the password into the
                                ; variable $0.
  CLEAR                         ; Clear the screen
  TRANSMIT $0                   ; Send the password to the remote system
  TRANSMIT "^M"                 ; Send a carriage return to the remote system
  RETURN                        ; Return to the very next line in the command
                                ; file after the call to this routine (i.e.,
                                ; return to WAITFOR "Please log on" 60 which
                                ; is the command following GOSUB GETPWORD

PROBLEMS:                       ; Start of PROBLEMS routine
  ALARM 1                       ; Sound beep to alert user of problem
  CLEAR                         ; Clear the screen
  LOCATE 10,20                  ; Locate cursor position on screen
  MESSAGE "****** PROBLEMS ACCESSING OCLC!! ******"
  ; Double exclamation points (!!) ensures a real ! will be sent, and
  ; NOT a carriage return
  LOCATE 12,20
  MESSAGE "PLEASE TRY AGAIN LATER!!"
  LOCATE 14,26
  MESSAGE "EXITING ...."
  PAUSE 7                       ; Pause 7 seconds so users have time to
                                ; read error messages
  HANGUP                        ; Disconnect modem
  QUIT                          ; Exit ProComm

END:                            ; If the routine jumped around the PROBLEMS
                                ; routine label, then you are successfully on
                                ; OCLC
```

The next examples illustrate command file use for logon to various online hosts through three networks (Telenet, TYMNET and DIALNET). As above, each program will require modification with personal id codes and passwords. For simplicity's sake, no error checking is provided for problems encountered during logon.

SAMPLE LOGONS FOR VARIOUS HOSTS

```
; Logon to DIALOG via DIALNET
IF CONNECTED
  PAUSE 5
  TRANSMIT "A"
ENDIF
WAITFOR "Enter Services;"
  TRANSMIT "DIALOG2!"
WAITFOR "SSSSSSSS"
  TRANSMIT "user number!"
WAITFOR "SSSSSSSS"
  TRANSMIT "password!"
WAITFOR "?"
ALARM 2

; Logon to Bibliographic Retrieval Services (BRS) via Telenet at
  2400 baud

IF CONNECTED
PAUSE 5
TRANSMIT "@"
TRANSMIT "^M"
WAITFOR "TERMINAL="
TRANSMIT "^M"
ENDIF
WAITFOR "@"
TRANSMIT "C 31520B!"
WAITFOR "MMMMMMMMM"
TRANSMIT "password!"
WAITFOR "MMMMMMMMMMMMM"
TRANSMIT "security password!"
ALARM 2

; Logon to BRS via TYMNET

IF CONNECTED
TRANSMIT "A"
ENDIF
WAITFOR "please log in:"
TRANSMIT "BRS;A"
WAITFOR "MMMMMMMMM"
TRANSMIT "password!"
WAITFOR "MMMMMMMMMMMMM"
TRANSMIT "security password!"
ALARM 2

; Logon to National Library of Medicine MEDLARS system via Telenet
  at 1200 baud

IF CONNECTED
TRANSMIT "^M"
TRANSMIT "^M"
WAITFOR "TERMINAL="
TRANSMIT "^M"
ENDIF
WAITFOR "@"
TRANSMIT "C 30120!"
WAITFOR "CONNECTED"
TRANSMIT "/LOGIN!"
WAITFOR "$$$$$$$$$$"
TRANSMIT "password!"
ALARM 2

; Logon to National Library of Medicine MEDLARS system via TYMNET

IF CONNECTED
TRANSMIT "A"
ENDIF
WAITFOR "please log in:"
TRANSMIT "NLM!"
WAITFOR "password:"
TRANSMIT "the network password!"
WAITFOR "+"
TRANSMIT "^M"
WAITFOR "connected"
TRANSMIT "/LOGIN!"
WAITFOR "$$$$$$$$$$"
TRANSMIT "password!"
ALARM 2

; Logon to OnTyme/CLASS e-mail via TYMNET

IF CONNECTED
TRANSMIT "A"
ENDIF
WAITFOR "please log in:"
TRANSMIT "EMSCLI"
WAITFOR "ID?"
TRANSMIT "CLASS.emailid!"
WAITFOR "KEY?"
TRANSMIT "password!"
WAITFOR "ACCEPTED"
ALARM 2
```

THE AUTHOR

STEVE CLANCY is a reference librarian with the Biomedical Library, at the University of California, Irvine. He received his M.L.S. from the University of California, Los Angeles in 1980. He has worked professionally in both hospital and academic medical libraries. As the SYStem OPerator of the WELLSPRING RBBS based at the Biomedical Library, he is a strong advocate of low-cost, quality software.

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HOW TO WRITE MACROS ON PROCOMM FOR ONLINE SEARCHING

by Barbara Lazewski
and
Robert Sessions
Information Services Department
Steenbock Memorial Library

Here is a step by step process to improve your productivity in searching online services with a microcomputer. Using MACRO KEYS—preloaded search statements—is an effective way to improve your search speed and economy over that of "dumb terminals." ProComm 2.4.2 allows the searcher to use macros within the communications program without having to buy and learn another program.

The process:

- Create a search strategy
- Formulate the strategy for the particular service you are searching
- Load the strategy into the macros, and save to disk
- Repeat as necessary for long strategies
- Begin communications
- Transmit the search statements upon receiving the prompt, using a single key press

Steenbock Library searchers have successfully used ProComm macros in searching six online systems, with searches of varied complexities since June, 1986.

WHAT IS A MACRO?

A macro key on ProComm 2.4.2. is the Alt key and a single 0-9 keyboard number key (e.g., Alt 1). Each can be programmed with up to 50 characters of search strategy and can be transmitted to an online service instantly by just pressing the Alt and number key. ProComm allows you to program an unlimited number of screens with ten keys each for online searching. Each screen can be loaded and displayed in a window during an online search.

WHY USE MACROS FOR STORING SEARCH STATEMENTS?

The main advantages of using macro keys in searching are:

- Typing is done offline which saves online time charges and allows you to proof state-

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ments. Searchers with complicated search strategies or poor typing skills will appreciate this feature, as it makes online searching less stressful.

- Flexibility and control of the strategy is maintained while keeping online typing time to a minimum because you only transmit one macro key at a time. This flexibility contrasts to uploading an entire search strategy and gnashing your teeth while watching an early error in a complicated strategy run through on online time, giving you false results.
- You can eliminate the stress of trying to second-guess set numbers in complicated searches by programming the search statements and after getting set numbers online, combining the set numbers online.
- If you find you've made an error in a macro key you've sent to an online service, you can reenter that line of strategy while online and then proceed with the rest of the preprogrammed macro keys.
- By preparing and programming alternative strategies before going online, you can quickly respond to postings messages without additional online typing time, and you don't have to use the alternative strategies if you don't need them.
- It's easy to change online systems during a search because it's simple to program search statements with the different formats necessary, before going online. Generic **OR** statements without qualifiers, field operators, or truncation can also be easily changed online. For example, a macro key (e.g., Alt 1) programmed for the BRS command **dog or dogs or canis or canine** could be changed to a Dialog command online by typing a **ss** and then **Alt 1**.

PROGRAMMING MACRO KEYS

1. When you turn on the microcomputer and the MSDOS menu appears, type in ProComm after the prompt. (i.e., **B:> procomm**)
2. Blank screen with flashing cursor and Alt F10 for Help message appears. This is called the Communication screen. Press **Alt F10**.
3. ProComm Help Screen appears. Under *Major Functions List*, look for *Keyboard Macros. . .Alt-M.* Press **Alt M** (no hyphens when pressing keys).
4. Keyboard Macros screen appears with keys already programmed listed. (Alt 0 to Alt 9). Press **C** for clear to get a blank screen to program on.
5. Type **R** to revise or create a new key. No carriage return is necessary.
6. **Key to assign:** appears on screen in a window.
7. Type the number you want to program. Your choices are 0-9 from above the keyboard or the keypad on the right side of the keyboard. THESE ARE NOT F1 – F10 KEYS. For example, type **1** with no carriage return necessary. **Alt-1:** will appear in the window with a flashing cursor.
8. Type up to 50 characters on that line. If the line is complete and correct, end it with an exclamation point (**!**). This tells the computer to read it as a carriage return or send command when it's transmitted to the online service. e.g. **Alt-0 lead or zinc or manganese or magnesium or cobalt!**
9. After you've typed what you want on a key, press **Carriage Return**.
10. An **Is this OK?** message appears. Check your line for exclamation points, typos, formats, etc. and if there's an error, type **N** with no carriage return necessary and it will take you back to what the key had before you tried to revise it. It is not possible to change just part of a line, you have to completely reenter it with the **R** for revise command.
11. If your line is correct, type **Y** with no carriage return and the key will be programmed with the information you gave it.
12. It is possible to stack search statements on a single macro key by typing a separate exclamation point after each portion to be transmitted. The exclamation point is the same as a carriage return when online, so each set of terms ending with an exclamation point will get a separate postings message and set number. e.g., **animal adj nutrition.de.! hair! mineral$1!**
13. If you type more than 50 characters on the line, only 50 characters will appear in the window and the extra characters will not be accepted. e.g., Alt-1 **lead or zinc or manganese or magnesium or cobalt o** (Reminder: BRS assumes an **OR** relationship if you enter two or more terms with a space and no operator in a single search statement. This could help you get more **OR**ed terms on a 50 character key.) e.g., **lead zinc manganese magnesium cobalt cadmium.**

14. If you want to transmit a line with more than 50 characters to the online service, on one key program up to 50 characters ending with a SPACE and NO EXCLAMATION POINT: (We do not want to transmit only part of our line of strategy with a carriage return to the online service at this point.) Program another key or keys with the rest of your strategy. End the last line of your strategy with an exclamation point to signify a carriage return. As most systems have around 240 character search statement limit, you shouldn't program more than five keys for one search statement. e.g., Alt-3 **lead or zinc or manganese or magnesium or cobalt** Alt-4 **or cadmium!** If you don't have room for a space on your first line, you could eliminate the space but then on your next key you must START WITH A SPACE. If you forget the space at the end of the first line and at the beginning of the second line, the lines will run together when you transmit the keys. e.g., **andfoline** rather than **and foline**. To correct this online, you could reenter the first key, manually insert a space, and then enter the next macro key.

15. After you have programmed all the keys you want on a screen (up to ten keys with 50 characters per key), print a paper copy of the screen (**shift PrtScr**) and write the file name on the paper copy for future reference.

16. Type **S** to save the screen of macros. You will receive a window box with the message **Save to File:**. Enter your disk drive, colon, and a short file name. e.g., **a:1** and carriage return to send the filename to the computer. This saves the entire screen of macro keys for later use in searching. If you want to program another screen of macro keys for either a complicated strategy on one database or for different strategies on different databases or online systems, press **C** to Clear the screen of the macros you've already programmed and continue with steps 5-16.

17. If you're in another screen and want to look at a previously saved screen, press **L** for Load and a window box with the message **File to Load:** will appear. Enter your file name .e.g.,**a:1** and carriage return and that file screen will appear.

18. Once a file has been loaded, you can reprogram keys if desired or just change the file name by pressing **S** to Save the file, giving it a new file name and carriage return. Later when you're in MS-DOS, remember to delete the old file. e.g., **Del a:1**.

19. Press the **Esc** key to exit the keyboard macros.

20. The Communication screen (blank Alt F10 for Help screen with flashing cursor) appears. Press **Alt F10** to get back to the ProComm Menu.

SEARCHING WITH MACRO KEYS

1. Decide on your search strategy and refer to your paper copies of programmed screens of keys so you know which macro keys you're going to enter in what order. You do not want to get mixed up and start transmitting keys from the middle of your search strategy. Make sure the first screen you want to enter is the one loaded on the macro keys. To do this, press **Alt M** and then **L** with your file name and carriage return. e.g., **Alt M L a:1** carriage return. Press **Esc** and **Alt F10** to get back into the ProComm menu.

2. Use the ProComm command files (**Alt F5**) or dialing files (**Alt D**) to get into the online service system.

3. If you want to make sure the correct macro screen is loaded when you're online, press **Alt M**. If the wrong macro screen appears, press **C** to Clear, **L** to Load and the correct file name and then **Esc** to get rid of the window and proceed with your online search. If the correct screen appears in the window, press **Esc**. *Don't press C for Clear or it will clear your keys from memory and you will get no response when you try to transmit a key.* They will still be on your saved disk so you could press **L** to Load them again.

4. Start the logging files command (**Alt F1**) to name and save your search results on your disk (note the communication screen now says **Log open**), get into the desired database, and get your first prompt.

5. When the 1st prompt is on the screen, instead of typing in the line of search strategy, just press the **Alt** and **#** keys (e.g., **Alt 1**) and your 1st line will rapidly appear.

6. If you don't get a postings message in a short period, check your paper copy of programmed keys to make sure you didn't forget to put an exclamation point at the end of the line of strategy. If you did forget the exclamation point on the

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programmed key, manually press a carriage return (not an exclamation point) and your line will be sent to the online service.

7. If you programmed several keys as part of one large search statement, press the **Alt** and **#** keys of the first part of your search statement. When it appears on the screen, press the **Alt** and **#** key of the next part of your search statement. Continue until you reach the **Alt** and **#** key of the line ending with an exclamation point. When the online service receives the exclamation point, it processes the entire statement and will give you a totaled postings message.

8. When two or more stacked statements are transmitted via a single macro key, each statement which ended with an exclamation point will get a separate set number and postings message. The first statement on the screen may be overwritten by succeeding statements so quickly that the first statement looks garbled. Often the last word will have the last letter and maybe a few from the beginning of the word, but the middle letters will be dropped. If you're not satisfied with the restatement of your strategy in the set number postings message, use the **DISPLAY SETS COMMAND** (BRS . .d; DLG **ds**; WILSONLINE **disp**; STN **Display history**; NLM **Display**; SDC **History**) to have a better looking search strategy to print out later.

9. After you've finished transmitting your first screen of macros and are ready to enter the second screen, while you're online just press **Alt M, L** with your next file name e.g., **a:2,carriage return, Esc** to get rid of the window with your keys in the middle of your online search, and proceed entering your keys.

10. After you've entered all of your screens of keys of your search strategy, proceed with your search as you normally do.

11. Logoff when you're done searching, press **Alt F1** to stop logging your file (note the communication screen message changes to **Log Closed**), **Alt H** to hang up the phone, and **Alt X** to get back to MS-DOS so you can either edit or print your file.

CONCLUSION

From the above instructions, we can see that the searcher is able to create and record a strategy before she goes online. When communicating with the database, she can transmit her strategy from these prerecorded files. This ability allows greater freedom from mundane and annoying problems of slow typing and spelling errors. ProComm 2.4.2 offers this macro facility from within the program, and hence is more convenient than earlier communication programs requiring a separate "memory resident" macro utility program. Features like these macros become important to a searcher because of the savings in time and money. More importantly, the searcher has time to deal with the strategy, system responses, and other online situations, which are higher level problems than typing errors. The authors hope other searchers will take the time to learn and use the advanced features of these most recent communications programs.

THE AUTHORS

ROBERT SESSIONS holds an M.L.S. from the University of Iowa and is a microcomputer experimenter—he loves to try out new hardware and software to see what it can do for Steenbock Library.

BARBARA LAZEWSKI holds an M.L.S. from the University of Illinois and tries to write down, in simple terms, the best of what Bob discovers so the four Steenbock searchers don't have to wade through the piles of documentation Bob already went through.

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software pick of the month

by Paula Hane
Editor, SOFT

This month's choice represents a major update to a standard communications program. Many users received Smartcom II bundled with the purchase of a Hayes modem and so are familiar with this menu-driven program. Smartcom III costs the same as CROSSTALK Mk.4 but runs fewer concurrent sessions and has a less powerful script language. Present users of Smartcom II can upgrade to Smartcom III for only $60 (if purchased before 1/1/87), or $30 (if purchased after 1/1/87). Two requirements to note: you must have a hard disk to run the new version, and also a fully Hayes-compatible modem.

AN 007306. 8710.
SN SOFTWARE NAME ..... **SMARTCOM III**
Version 1.0A
Date Released 1987
Cost ..... $249.
AD Name ..... Hayes Microcomputer Products, Inc.
Street ..... P.O. Box 105203
City, St., Zip ..... Atlanta, GA 30348
Phone 404/441-1617; 800/241-6492
AP APPLICATION ..... COMMUNICATIONS, GENERAL PURPOSE, TERMINAL EMULATION.
PD PRODUCTION DESCRIPTION ..... This is a major upgrade over Smartcom II, adding new features such as a powerful script programming language and the ability to handle two communications sessions at the same time. The program includes several ready-to-run scripts for access to information services, including CompuServe and The Source. The script language, called SCOPE (Simple COmmunications Programming Environment), comes with a learn mode. Other features include a peruse buffer with user-specified capacity up to 100K, an ASCII text editor, DOS operations without exiting Smartcom, file compression and file scrambling to speed up file transfer and provide data security, and online help. Not copy protected.
OS OPERATING ENVIRONMENT
Operating System(s) ..... MSDOS or PCDOS 2.0 or later
Disk Size ..... 5 1/4", 3.5"
HD HARDWARE REQUIREMENTS ..... IBM PC, XT, AT, PS/2 and compatibles; 512K RAM; hard disk. Supports Hayes modems.
DO DOCUMENTATION .....Manual, Learn mode, script examples.
SR SOFTWARE REVIEWS .....
MAGAZINE NAME: *InfoWorld*
ARTICLE TITLE: Impressive Features Improve Top Communications Program.
REVIEWER NAME: Bigley, Tom and Glen Tapanila
DATE: September 14, 1987
VOLUME: 9
NUMBER: 37
PAGES: 50,54,58,60.
COMMENTS: Good overall, with very good ease of learning and producer support, but only satisfactory rating for documentation and ease of use. The menu-driven program can be awkward for experienced users because the program will not accept direct commands. The program is a space hog, taking over 1 MB on the hard disk and requiring 512K of RAM. Reviewers liked the peruse buffer and the Learn mode. Does conflict with some memory-resident programs, like Sidekick.

NOTEWORTHY RELEASES

ADOBE ILLUSTRATOR, version 1.01 $495.
Adobe Systems Inc.
1870 Embarcadero Rd.
Palo Alto, CA 94303
415/852-0271
A graphics/drawing program for the Macintosh.

HYPERCARD
Apple Computer Inc.
20525 Mariani Ave.
Cupertino, CA 95014
408/996-1010
A new program to create links between "cards" of information.

For more information about this month's Noteworthy Releases, or other software, search the SOFT file on BRS.

Communications to the editor of the SOFT file should be addressed to Paula Hane, Lakeview Terrace, Box 153, Amawalk, NY 10501; OnTyme-CLASS.ONLINEPH.

Desktop Publishing in Libraries

By Steve Cisler
Contra Costa County Library
Pinole, California

Editor's note: The following pages convey the essence of desktop publishing. Intentionally, these pages did not pass through ONLINE's normal production cycle. The article and sidebar were created and produced in California and Pennsylvania and sent to us complete - camera-ready!

Flexibility is a keyword when discussing dtp. Hundreds of typefaces are available (you will see several examples used within the article). Column setup is quickly executed (ONLINE's columns are 8.25" high, 16 pica wide with 2p between columns. Integration and quality are other keywords. Graphics are easily inserted. Quality of output is, in fact, a primary reason to use dtp. Compare this article and sidebar to the other articles - all typeset in 9/10 Aster - in this issue.

But first, read on! You'll see what the proper equipment combined with a bit of imagination can produce.-HG

This article shows how desktop publishing can be used by the librarian and professional online searcher. Several popular systems are covered: their components, the cost, and how desktop publishing changes work patterns in some organizations.

BACKGROUND

This section was set in 10 pt. Bookman.

DESKTOP PUBLISHING is a phrase coined by Paul Brainerd of Aldus Corporation, publishers of PageMaker, the best selling page layout program for personal computers. A desktop publishing system consists of a personal computer using a program that allows you to import or enter text and

this application has given rise to a new market for the computer industry

graphics elements on the screen, edit and move the different elements around, and print them out on a dot matrix or laser printer. Most systems make use of laser printers, hard disks, and some use special scanners that convert drawings and photographs into digitally stored images that can be incorporated in the document. The final printout is used as a camera-ready master for duplication. Some graphics shops use the laser output as a proof sheet before the master is typeset on a Linotronic or other typesetting machine. Because the results are so impressive and comprehensible to computer novices and experts, this application has given rise to a new market for the computer industry.

IMPACT

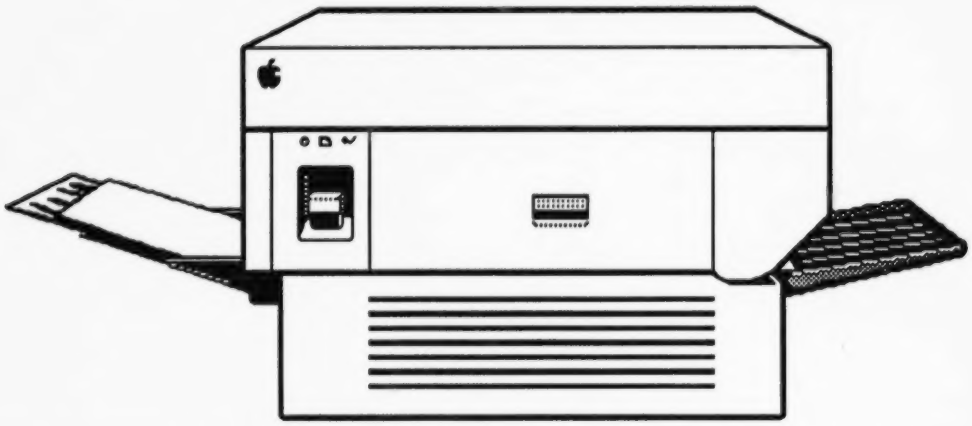
This section was set in 10 pt. Helvetica.

Nobody talks much any more about the paperless society, even with the increased use of computers. Printed material is still the most common means of communications for many organizations. You and your library will be judged by the reader of each brochure, letter, or memo, exclusive of content. Librarians *know* the substance is not lacking in what they publish, but sometimes the form needs more enhancement. If you want to be remembered in a positive way, you can't send out an important report printedon a dot matrix machine. Until this year, a daisy wheel printer was acceptable, but now the ante has been raised; people expect laser output for quality work. If you print downloads from online sessions in draft format, consider the impression the same material will make if it looks typeset. An expensive report from a consultant carries more weight if produced on a laser printer. I don't claim that it will take less time to write than a document produced the old way, but it will print more quickly and have more impact on your client, your boss, or the reading public.

COSTS

This section was set in 10 pt. New Century Schoolbook.

How much impact can you afford? Upgrading to a desktop publishing system is not inexpensive, but not using one may be more costly. Figuring the true cost of a desktop publishing system depends on many variables: what you are spending now for graphics and typesetting services, the process you use now for the preparation of various documents, and what kinds of discounts you can find for different brands of new equipment.



Apple LaserWriter

If your public or school library, academic library, or government office owns no Macintosh equipment, you can easily justify buying a system (Macintosh Plus, HD-20 hard disk drive, and LaserWriter Plus printer) on time if you spend $300 a month on typesetting over a two year period. This reflects typical discounts and interest rates given by Apple to those institutions. It would be less expensive if you pay up front. Should you pay the full re-

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tail value (an unlikely possibility), figure $450 per month. This is a very rough estimate because you will have some training involved, time spent on the layout, but will be able to use it for many other activities than desktop publishing. There are other systems which will be less expensive (clones and the Atari) and more expensive (Xerox, IBM, HP). It has been estimated that training time for a Macintosh is eight times less than on MS DOS machines, so this could be a big factor in choosing a system.

LASER PRINTERS

This section was set in 10 pt. New Helvetica Narrow.

The resolution of dot matrix and laser printers is measured in dpi, dots per linear inch. Although reports and newsletters produced on a desktop publishing system can be printed on a dot matrix printer with 72 to 150 dpi, most people have access to a laser printer that has a resolution of 300 dpi. This is sometimes called "near-typeset quality." To the untrained eye, it looks about the same as a book or a magazine for which a standard of 1250 to 2500 dpi is common. For correspondence, internal publications and newsletters, the 300 dpi resolution will be quite acceptable. For publications printed on glossy paper, a higher resolution may be more appropriate. Compare this article to the others in this magazine to see the difference in the quality of the typeface. Most laser printers make use of a "page description language" that communicates the computer commands to the printer. The most flexible and popular is PostScript from Adobe. Typefaces and illustrations are scaled by the program, so the letter "Q" will have the same proportions at six points or 128 points in size. The PostScript language is in the public domain and is used to create many special effects for logos, letterheads and other graphic designs. It is supported by Apple, IBM, and even Hewlett-Packard.

There are so many new laser printers on the market each month, it is impossible to make a recommendation. Although this may lead you away from buying an unknown brand, keep in mind that the main copy components in the printers are made by Canon

Xerox's Ventura Publisher

by Pamela N. Danziger
Director, Information Research Services
The Franklin Mint

Most software reviewers agree that Xerox's Ventura Publisher offers the most advanced capabilities of any other desktop publishing package for the IBM DOS environment. For those of you considering purchasing a desktop publisher for an IBM or IBM-compatible computer, I hope this brief article can help you to prepare for the challenge of learning how to use Ventura to produce newsletters, reports, presentations, and documents that are of outstanding quality and a pleasure to read.

The Franklin Mint's Information Research Center publishes a weekly newsletter that summarizes articles from trade journals, newspapers, and magazines that identify new consumer, industry and fashion trends. The Franklin Mint is the largest marketer of fine quality collectibles, and its executives and marketing managers use the newsletter as an environmental scanning tool.

After publishing the newsletter for several months using our MultiMate word processor, the IRC upgraded to the Xerox Ventura Publisher and a HP Laserjet II printer to enhance the production and appearance of the newsletter. The good news is that four days after installing the desktop system on an IBM PC XT, we published the newsletter in its present format. The bad news is it took virtually every minute of those four days to make that happen.

Ventura requires a fair amount of sophistication with the PC and DOS to even get started, and a fair amount of training after that to learn the basics of the program. Installation alone takes about one-half hour to load up to 13 different floppy disks. You also have to install a mouse using one of your PC's serial ports. Since your modem and possibly your printer may also use a serial port, you will have to make sure that the ports are assigned properly by each software package that uses a serial port.

Ventura's user interface, what you see on the computer screen, is outstanding. Unfortunately, the documentation fails to give the user clear instructions and guidance in using the many options available in designing their documents.

In Ventura's defense, it takes both knowledge of computers and knowledge of typesetting to get the most from the pack-

age. Ventura helps the new user a great deal with the typesetting expertise by providing canned style sheets for about 20 different kinds of document formats, such as management reports, newsletters, presentations, and even formats for publishing a phone directory imported from dBase.

The best way to approach Ventura is to select a canned style sheet that looks closest to the document you have in mind, then modify that style sheet to your liking. The style sheet works by dividing sections of your document into paragraphs, with each separate paragraph having different style attributes. If you change an attribute describing a feature of a particular paragraph, for example, if you change the type size of the subheading paragraph in your document, Ventura will change that attribute of all paragraphs in your document with that name. In this example, all subheadings would be changed to the type size you specified. This allows you to easily design a consistent format for your documents.

The text for your document is most often taken from your word processor and loaded into Ventura for formatting and printing. To format the document, you must define the various paragraphs that makeup the document. You can do this either before or after you load the document into Ventura. With the up front design of the document stored in the style sheet, you can publish a great weekly newsletter simply by changing the input file. Ventura and the style sheet do the rest.

Despite the difficulties in getting started, I am extremely pleased with the results of the work we have done with Ventura. The newsletter looks professional and includes a table of contents generated by Ventura. I expect to continue to find new uses for Ventura. The features that have made it an indispensable tool in our IRC are:

- its compatibility with word processors and other IBM PC programs,
- its canned style sheets for designing new document formats,
- its high quality output, and
- its well designed user interface.

If considering Ventura for your information center, I am sure you will find the results of your efforts with this program will be well worth the investment in time and money.

Communications to the author should be addressed to Pamela N. Danziger, Director, Information Research Services, The Franklin Mint, 1 Franklin Center, Franklin Center, PA 19091.

and a few other large Japanese manufacturers. What you will pay extra for is speed (pages per minute), memory--to capture a full page of graphics from the computer, and the compatibility with PostScript.

one can rent a Macintosh Plus and LaserWriter Plus for $5.00 per hour including 50 free copies!

In many towns, "laser shops" are opening up to provide walk-in service to computer owners who wish to rent time on a laser printer. Check the Yellow Pages under *Printers*. Many are associated with rapid printing shops. Others are independent. If there is one near you, I recommend you try out the equipment and talk with the owners about reliability and ease of use. Prices vary widely, but in a heavily saturated market such as Berkeley, California, one can rent a Macintosh Plus and LaserWriter Plus for $5.00 per hour including 50 free copies! Other places charge up to $1.00 per copy.

MACINTOSH

This section was set in 12 pt. Times.

The Apple Macintosh is the tool that was placed in the hands of hundreds of thousands of computer users, giving them the power to design and print their own magazines, reports and resumés. All that was needed besides a 512K computer was the LaserWriter. It was simple to operate; no special monitors, cards, or interface devices were needed. The operating system was designed so that it could handle many different fonts. There are hundreds of dot matrix and many new laser typefaces available for the Macintosh, any of which can be added to or discarded from an individual machine in less than a minute. People buying the Macintosh for desktop publishing found they did not have to dedicate the machine to any one activity. Once PageMaker sales began growing, it began driving the sales of the Macintosh and the Apple LaserWriter

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in Clifton Falls Library

It is rare to hear about a new product where the first group to accept it is the library community. CDROM is one promising exception. A CDROM is a 4.72" diameter plastic disk that stores information equal to 250,000 pages of text. Instead of storing it in a floppy disk or hard disk, it is stored on an optical disk that looks like an audio compact disk.

The CDROM is placed in a CDROM drive which uses a laser to read or access the information on the disk, and this is displayed on the computer screen.

What is available?

At Clifton Falls Public Library you may use the Macintosh Public Access Catalog and the *Books in Print* on CDROM.

Where are they located?

There are readers in the reference department, the main reading room, and at the information desk.

How do I use them?

Ask a librarian for assistance or read the instructions inside this brochure.

This brochure cover was designed using Ready,Set,Go! to place the text, draw the border rectangle and import the Desktop Graphics (302/736-9098) picture.

(now selling at six thousand units a month).

Apple realized this was not just another market niche. People using desktop publishing produced work that anyone could tell was superior to most products turned out on daisy wheel and dot matrix printers. The people working these miracles spread the word about the quality and the ease of use. Apple continued to improve its product line in 1986 and 1987 with the Macintosh Plus and SE models, both of which are ready for desktop publishing work without the addition of any extra equipment other than a connector to the LaserWriter.

IBM

This section is set in 10 pt. Avant Garde.

On the other hand, MS DOS machines have been at a great disadvantage except from a numbers standpoint. Apple offers more standard features than the MS DOS market which is scrambling to catch up. Most of the MS DOS machines are text oriented rather than graphics machines; the pixel shape is not proportional, so there is distortion in many screen displays. Extra cards and monitors are needed to run the desktop publishing programs. The interaction between the software, the evergrowing choice of computers and peripherals gets more and more confusing, especially for the beginner. In numbers of systems sold, both Macintosh and MS DOS systems will be selling about equally by the time this is published. For the information professional who has been getting along well with a low resolution graphics card in an XT-class machine, the question will be

how much to upgrade, if at all.

It may be wiser to buy a complete system consisting of an AT class machine, hard disk drive, laser printer, and desktop publishing software for as little as $5000 (Alpha Omega: 800/874-0596). If you have to buy IBM, wait until late 1987 for the System 50 offering which was announced in April 1987. IBM's Pageprinter, a laser printer, will retail for $2,199. Staying with MS DOS may be confusing, even for long time IBM users, but when you have to incorporate documents from Word Star, Word Perfect, or Display Write in your newsletter, it may be best to have a software package that can integrate those files in those formats.

Atari recently announced a $1500 laser printer that works with its inexpensive microcomputers. Formatting a whole page of graphics takes over one megabyte of memory, and the Atari puts the memory in the computer, not in the printer, as do Apple and other manufacturers. If compatibility is not an issue, the Atari deserves a close look for value. With it you can start publishing for less than $3000.

The Apple IIe and II gs, the latest model in the Apple II family of computers, will have page layout programs available from Springboard and Broderbund. The price range will be $100 to $200, far below the Macintosh and IBM offerings. They will work on the LaserWriter.

SOFTWARE

This section was set in 10 pt. Palatino.

Aldus Corporation is riding high with PageMaker, the leading program for the Macintosh, and the blessing of IBM. Pagemaker 1.0 for the IBM will be bundled with the new IBM system. Alone it will retail for $695. PageMaker 2.0 for the Macintosh costs $495 and allows the exchange of PC and Macintosh files. The company has very good but not inexpensive support for its customers. Other Macintosh programs have been completed that work in complete harmony with PageMaker. Adobe Illustrator and Microsoft Word 3.0 are two primary examples.

Ready,Set,Go! languished in PageMaker's shadow until version 3.0 was published in late 1986. It followed the Macintosh interface and is considered by many to be the easiest to use of the full-featured page layout programs. Its features qualify it for duty as a word processor (though it has limited mail merge or footnoting capabilities) yet it has the capacity to do very large reports and books. This article was composed with Ready,Set,Go! 3.0.

There are several ways an individual or a group will justify purchasing a desktop publishing program or system: to enhance the visual quality of existing documents; to start a project such as a company newsletter, a book, or journal; to save money spent on professional typesetting services by producing proof sheets on the laser printer or by using them as the final output.

Most of the raw material online searchers work with is in the form of ASCII text. Except for 110 volts, it is the one true standard microcomputer users have! Any electronic mail message, any download from an information provider, or any bulletin from a BBS can be re-formatted in a page layout program for attractive display.

This is especially useful for corporate libraries doing executive summaries of online searches. No longer will you have to send out a copy of a dot matrix printout.

You can plug the text file into a desktop publishing template and not have to worry about spacing, carriage returns, yet come out with a professional looking report without spending a lot of time and energy.

Once acquired, the system will be used for many other purposes because it is so versatile. The same program used for a monthly newsletter can be used for correspondence (both letters and envelopes), flyers, signs, bookmarks, labels, annual reports, posters, nametags, and ALA inter-library loan forms.

The project that brought home the power of this system to me was the production of a 35 page manual for an online service. The WELL is a regional computer conferencing system whose manual had never been printed and offered to the subscribers. It was written by a professional but as a volunteer effort for the system. It was online in a menu-driven form as well as a straight ASCII file about 60K in size. I downloaded this file onto my hard disk. ASCII art had been included in the form of dotted lines, underscoring, boxes, and asterisks for decoration. I used Ready,Set,Go!3 and set up an 8 1/2" by 11" page sideways and set two columns for the text. I selected a font size that was small enough so an 80 character ASCII line would fit. Automatic page numbering was added, and enough blank pages in the proper format were added before importing the 60K file. It flowed into the blank pages in about one minute.

Because the basic document was sound, free of typos, I merely had to adjust it for correct page breaks and correct tab settings for charts. Moving from a monospace ASCII file to a proportionally spaced font presents a few design challenges. But in a minimum amount of time I was ready to print my camera-ready copy. The 35 pages printed in about ten minutes. This will vary enormously depending upon the number of typefaces, styles, and graphics you integrate into your document. I was able to download a 60K ASCII file, re-format it in Ready, Set,Go!3, print it on the Apple LaserWriter Plus and have 50 copies duplicated and bound within 24 hours for $1.75 each.

The same process I used for the manual is applicable to online searchers who, minding copyright restrictions, produce summaries of searches for clients and patrons. It is an extremely rapid way to produce an attractive list of citations. Instead of using two columns sideways on the paper, use one column for the download but leave space on either side for your annotations or comments. Keep your document simple; there is a tendency to use too many typefaces and ornaments when first starting a desktop publishing project.

LOOKING AHEAD

Dataquest, the San Jose, California, market research firm, predicts that the current $306 million market will expand to $4.6 billion by 1990. CAP International is more conservative, predicting a $3 billion market by 1991.

I know we will see at least three developments: cheaper printers and special monitors, more programs than the market can support, and printers with more features.

1. *Low-end printers*: look for Atari's $1,495 model for use only with Atari computers; Asian laser printers for $1,295 have been announced.

2. *There are over 40 page layout programs for various families of computers.* Many others advertise their desktop publishing features (such as More from Living Videotext and MacDraw from Apple and

Illustrator from Adobe). This will increase at the same time more word processing programs integrate page layout capabilities. Microsoft Word 3.0 for the Macintosh has already done this as has Ready Set Go!3.

3. *Resolution and speed will increase.* 400 to 600 dpi printers are on the market now. Desktop typesetting machines in the ten to twelve thousand dollar range could appear from major manufacturers. The users of these machines will begin to work in groups, and we will have multi-user applications to speed up the publishing efforts of organizations. We will also see a shift from character-based machines (IBM) to graphics workstations running under the Macintosh or Windows environments. Support for the huge base of current MS DOS machines will continue. This was most evident at a recent desktop publishing fair in San Francisco tht atracted any current owners of PCs, XTs, and ATs.

OTHER RESOURCES

Personal Publishing, Box 390, Itasca, IL 60143. $30 for 12 issues. This was the first magazine out of the starting blocks for this market. Good professional reviews, an abundance of ads from small and large companies, how-to articles, and an annual directory.

Publish! Box 51966, Boulder, CO 80321. 12 issues for $23.95. From the publishers of MacWorld and PC World comes this slick monthly. Widely available.

1987: Year of the Reader
001.64 : TOOLS FOR THOUGHT, by Howard Rheingold. When truly powerful computers harness the knowledge of the world in the 1990's, we'll remember these visionaries of a new technological age.

This bookmark was designed using Ready,Set, Go! for the text and MacPaint for the light.

Colophon, Adobe Systems Inc., 1870 Embarcadero Road, Palo Alto, CA 94303. Free. A beautifully composed quarterly from the company that developed PostScript. Each issue has many ideas for better use of laser printers that use PostScript.

Matthews, Martin. *Using PageMaker for the PC* . 1987. Osborne McGraw-Hill, $22.95. ISBN 0-07-881264-X. Issued at the same time as the program was introduced. This common marketing strategy for software leads me to believe the manuals were never meant to satisfy the customer.

Rardin, Kevin. *Desktop Publishing on the Mac: a step-by -step guide to the new technology*. 1986. New American Library $22.95. ISBN 0-452-25902-9. Limited to using the Macintosh and PageMaker, but good sections on basic design in addition to details on individual projects. A good example of what desktop publishing can do.

Online resources:

This was set in 10 pt. Courier.

CompuServe: Aldus has a PageMaker Special Interest Group. Phone 800-848-8199, (614-457-0802 in Ohio) for information about joining

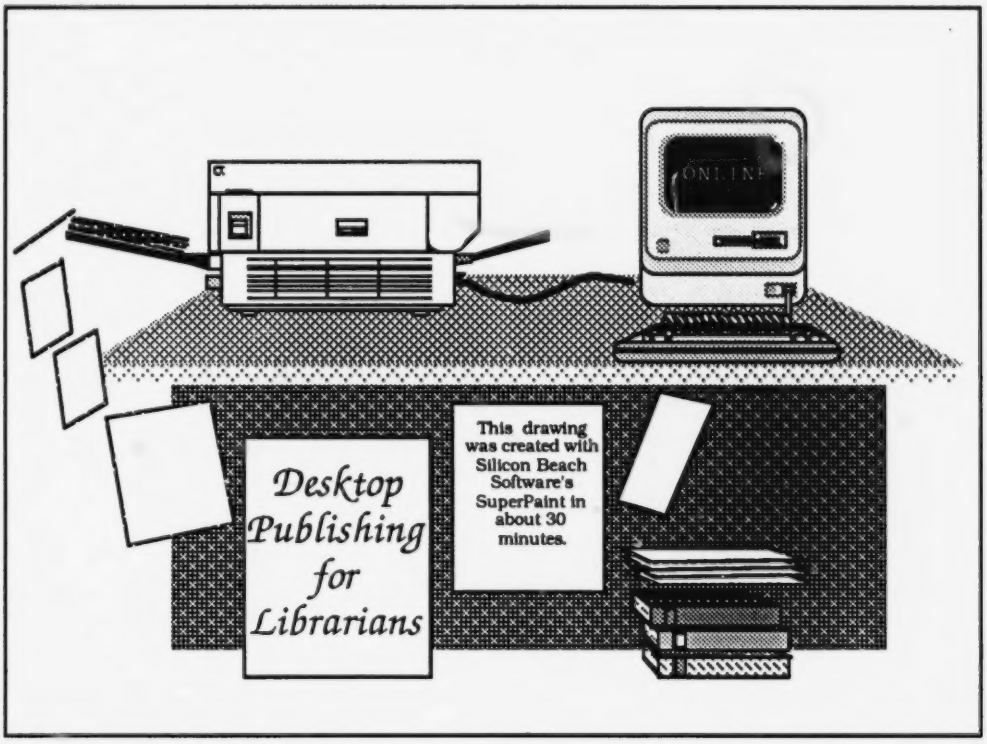
CompuServe.

The WELL has a desktop publishing conference that is very active. This regional computer conferencing system can be reached through TYMNET. Phone 415-332-6106 to register by modem. $8 per month plus $3 per hour plus TYMNET charges.

BIX, Byte Information Network has a PostScript conference and a desktop publishing topic in the Writers conference. Phone 800/227-2983 for information.

National Independent PostScript™ Support Board is a free electronic BBS to provide files and discussion groups for people interested in PostScript programming and desktop publishing. Phone (409) 244-4704 (modem) or (409) 244-4075 (voice).

Steve Cisler can be reached at 625 Barnacle Way, Suisun, CA 94585. Network addresses: CompuServe- 73240,1016; WELL- sac; OnTyme- Class.ciracs014; Bix- scisler.


ONLINE
Desktop Publishing for Librarians
This drawing was created with Silicon Beach Software's SuperPaint in about 30 minutes.

MONITORING COLOR IN LIBRARIES

by Margaret A. Cribbs
Magellan Data Management &
Archive Team
Jet Propulsion Laboratory

"We don't need color monitors—they're a luxury." That is the consensus of librarians upon being asked about straying from monochrome displays. A writer researching the state of color monitors in libraries would have little to report. Use is limited and specific applications are few. As is common wisdom in management circles, however, directors of any operation are wise to monitor not only the state of affairs at present, but also trends taking root. The color monitor may be a luxury now, but soon may well be a necessity because of the extent of research and the breadth of promise in information display. With this in mind, the following is a review of current issues, concerns, and uses of color monitors in libraries, a look into future applications, and finally, notes on how to select one.

CONCERNS AND CONSIDERATIONS

As is frequently mentioned in reviews concerning color monitors, the intuitive understanding of information on a screen is vastly enhanced by a color display, and many users feel that higher resolution color screens prove easier on the eyes over long periods of use. While this kind of argument may serve to encourage library directors to invest in color monitors on a limited basis, it has not proved a motivator for widespread commitment of libraries to color displays.

Clearly the most prevalent concern in the question of color monitor procurement is that of *cost*. High resolution, versatile screens have list prices upwards of $1,000. A second concern voiced by librarians polled, involved the lack of graphics and image-related applications which necessitate a higher resolution color screen. Since monochromatic displays provide good resolution for text and simple graphics, library-oriented software precludes the need for color.

A third consideration continues to be the most troublesome of technology issues: obsolescence. While most of this article will concern color monitors compatible to standards designed by International Business Machines (IBM), it should be stated that the display hardware of the new class of IBM personal computers, the Personal System/2, is in many ways incompatible with the heretofore "IBM standards." Purchasers of equipment today may rest assured that the previous IBM standards ►

will continue to enjoy hardware support because of widespread compatibility in the computer market. Nevertheless, buyers should always keep flexibility and upward compatibility foremost in mind when choosing new hardware.

CURRENT USES OF COLOR IN LIBRARIES

The introduction of color monitors in libraries may turn out to be more dependent on the initiative of outside companies than on the budget decisions of directors. More and more companies, particularly those marketing Compact Disk Read Only Memory (CDROM) products, provide workstations outfitted with color monitors instead of monochrome.

In one case, the H. W. Wilson Company recently offered color bibliographic displays to library environments. Wilson donated a workstation comprised of the IBM PC XT with Enhanced Graphics Adapter (EGA) board and compatible color monitor, a CDROM player, a modem and a printer to each of the 60 ALA-accredited graduate schools of library and/or information science. The workstation, while meant to introduce potential users and purchasers to the Wilson line of compact disk databases, may be the first glimpse many users will get of color on library screens.

The number of bibliographic retrieval software packages which make specific use of color continues to grow. Bowker Electronic Publishing's *Books in Print* in its CDROM incarnation is one example. Another is the upcoming CD issue of the Library of Congress' *Name and Subject Authority File*. An example of an online bibliographic utility which employs color is NOTIS, developed by Northwestern University in Chicago, Illinois. NOTIS serves as the bibliographic utility for the Aerospace Research Information Network (ARIN), which provides an electronic link and shared cataloguing among all the National Aeronautics and Space Administration (NASA) library centers.

NOTIS' use of color in its bibliographic display definitely enhances the manipulation of information in MARC format, explain librarians Jennifer Momjian and Barbara Amago of NASA's Jet Propulsion Laboratory (JPL). In the NOTIS display, all fields which cannot be altered show up in blue characters. Those which can be changed are green. Further, should the system detect an error, the error message shows up in white at the top of the screen, and the field in question switches to red.

According to Momjian, this kind of display boasts two benefits for the user. First, the user can input and manipulate data in a more intuitive way, taking cues from colors rather than having to study the text on the screen. Second, the visual display proves easier both to comprehend and to read. This helps expedite training and eases the visual burden of operators charged with sitting at the terminal for hours at a time.

In special and academic libraries, color monitors may find their place in computer laboratories and learning resource centers as well as in technical services. At the University of Southern California (USC), two color PC monitors were purchased for the Doheny Satellite Microcomputer Library, originally, in order to accommodate software which required color monitors. Despite the fact that the software in question no longer requires a color display, the two color screens have continued to be in demand. According to librarian Richard Halvorson, the PCs outfitted with color have become the most popular monitors, both for students using commercial software and for those developing their own. CDROM players are available at every one of the IBM PCs in the library, and with them, students get access to *Grolier's Encyclopedia* and the USC in-house catalog, *Homer*.

Color serves more specific purposes at the Biomedical Library Learning Resources Facility at the University of California, Los Angeles (UCLA). The facility, open to students and faculty in the Health Sciences, offers instructional material available commercially on floppy disk and videodisk. CDROM applications are currently being explored as well.

The use of color monitors is imperative for the instructional software available to UCLA students. . .

The use of color monitors is imperative for the instructional software available to UCLA students, as the illustrations, text, and graphics demand the display capabilities of EGA boards. Color is used extensively in the software to distinguish elements in biological images, to illustrate graphics, and to easily highlight certain areas of text.

Until recently, two different types of monitors were required to accommodate the images produced in digitized form (available on floppies and on CDROM) and those produced in analog format on videodisks. (A television receiver/monitor handled the analog signals, and PC monitor accommodated digitized materials.) Solutions to the problem of media/

monitor incompatibility take the form of new monitors which can handle both signals, some alternating between the signals, and some displaying both simultaneously. UCLA recently obtained a Sony PVM 2030, a monitor/receiver capable of switching between the two signals, so that users might view digitally-stored textual or graphic information on the screen, and then switch to another mode in order to view videodisk displays.

FUTURE USES OF COLOR MONITORS

To what extent the purchase of a color monitor might benefit more general library operations and services remains an open question, one almost entirely dependent upon developments in online databases. While at this stage of information retrieval technology there is little specific need for color, a most definite need

. . .a most definite need will arise once databases expand from text-and-graphics-only to images.

MONITORING COLOR IN LIBRARIES—SELECTED MONITORS

Eighteen monitors for use with IBM-compatible computers were reviewed in *PC Magazine's* March 31, 1987 issue. The following is a list of the EGA-compatible and multisync-type monitors which had very favorable ratings. List prices are current as of July 1987, but it should be noted that much lower prices can be obtained through mail order, wholesale, or retail promotion.

Buyers should note the essential fact that the IBM Enhanced Color Display, while available now for IBM systems, will cease to be produced as IBM develops its new set of standards for the IBM Personal System/2 line. The monitor has excellent ratings, however, and users upgrading existing IBM-compatible systems can still find them on the market and can continue to expect support for them by IBM.

EGA-Compatible Monitors

- **IBM Enhanced Color Display**
  IBM Corporation
  1000 NW 51st Street
  Boca Raton, Florida 33432
  800/447-4700
  List price: $849.

- **Mitsubishi XC-1430**
  Mitsubishi Electronics America, Inc.
  991 Knox Street
  Torrance, California 90502
  213/515-3993
  List price: $719.

- **PC's Limited EGA XC1430C**
  PC's Limited
  1611 Headway Circle, Bldg. 3
  Austin, Texas 78754
  800/426-5150
  List price: $529 (mail or phone order only).

- Princeton HX12E
  Princeton Graphics Systems
  601 Ewing Street Bldg. A
  Princeton, New Jersey 08540
  609/683-1660
  List price: $695.

Multiscan Monitors

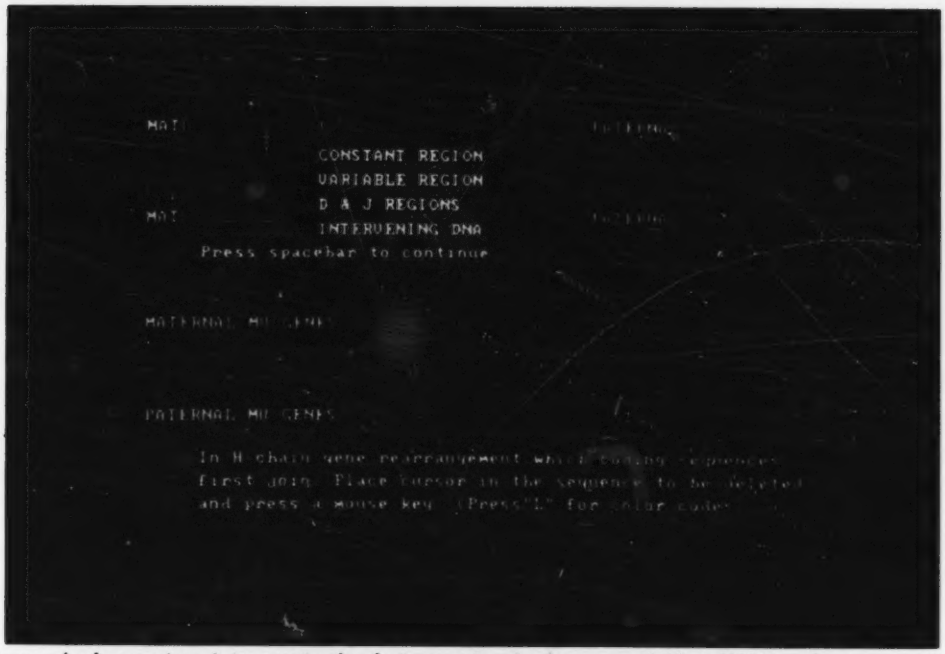
- NEC JC1401P3A MultiSync
  NEC Home Electronics (USA) Inc.
  1401 Estes Avenue
  Elk Grove Village, Illinois 60007
  312/228-5900
  List price: $899.

- Taxan Super Vision 770
  Taxan Corp.
  18005 Cortney Court
  City of Industry, California 91748
  818/810-1291
  List Price: $945.

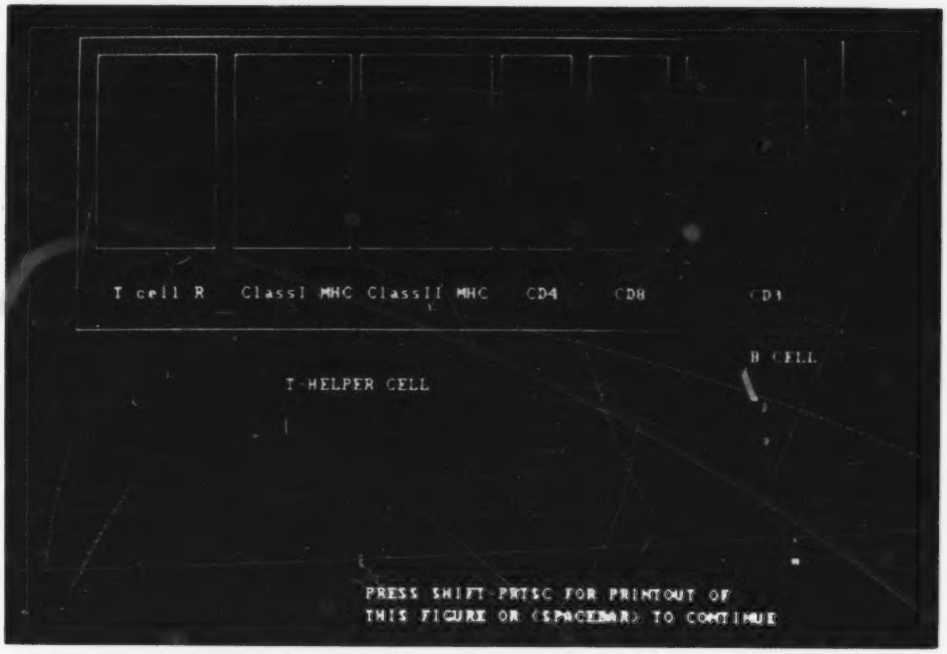
- JVC GD-H3214
  JVC Information Products Co. of America
  41 Slater Drive
  Elmwood Park, New Jersey 07407
  201/794-3900
  List price: approximately $900
  (Cannot be purchased as a separate peripheral—available as part of entire systems). —M.A. Cribbs

According to users at NASA's Jet Propulsion Laboratory, NOTIS' use of color in its bibliographic display definitely enhances the manipulation of information in MARC format. Because of the color screens, the user can input and manipulate data in a more intuitive way and the display is easier to comprehend and read.

Here's how the same NOTIS display looks on a monochrome screen.



The use of color monitors is imperative for the instructional software available to UCLA students, as the illustrations, text, and graphics demand the display capabilities of EGA boards. Color is used extensively in the software to distinguish elements in biological images, to illustrate graphics, and to easily highlight certain areas of text. Slides by Anthony R. Kwak, Head, Learning Resources Division, UCLA Biomedical Library.
Shown: computerized test dealing with expression and assembly of immunoglobulin genes.



The structure of some members of the immunoglobulin supergene family.

will arise once databases expand from text-and-graphics-only to images.

One such image-integrated catalogue, developed jointly by the University of California at Berkeley and Image Understanding Systems of San Jose, California, allows users to query a database using text, geographic coordinates, or base maps, and then summon text, geographic images, and art images resulting from the query. This technology requires a monitor with sufficient resolution to do justice to the images and—especially in the case of art images—to the color. It also requires vast amounts of digital storage and a powerful central processing unit, since the system boasts image processing capabilities.

The Berkeley prototype was developed on a SUN 3/160 workstation, and was exhibited at the 1987 American Library Association conference in San Francisco. Two of its developers are responsible for the combined geography/art orientation of the database. Daniel O. Holmes of the Department of Geography received his Masters in Library Studies from Berkeley in 1986, and Howard Besser, Information Systems Manager at the University Art Museum, is currently pursuing his Doctorate there.

Other databases of this sort are being explored in earth and planetary sciences. Currently envisioned are databases which would allow geologists, for example, to input a set of coordinates and then view color images for geographical features or mineral composition. Representing the image capability of this kind of database, a CDROM containing images of Uranus and its moons, as taken in 1986 by the Voyager spacecraft, is now available to researchers and libraries through the University of Colorado. An AT-class personal computer with an EGA board and multiscan monitor is the best combination to use to explore these images.

COMMERCIAL PRODUCTS AND THE COLOR MONITOR

There is little doubt that most software packages are easier to use when they are capable of exploiting a color display. Word processing, desktop publishing, communications and spreadsheet packages make very effective use of color, but that effect is often downplayed in advertisements. The reason for this is that little marketing advantage can be gained from a manufacturer's stressing the wonders of color since few of them wish to imply that a package does not work well on any machine with appropriate power and memory. What is stressed, naturally, is the package's adaptability to a variety of hardware combinations.

In other cases, not just monitor hardware but also peripheral hardware may thwart the fan of color displays. Here it is the printer which fails users, for although desktop publishing and financial management packages employ colors in very effective ways, none of the effect on the screen can be transferred to print by common dot matrix or laser printers. A far more expensive color printer is required.

CHOOSING AN IBM-COMPATIBLE COLOR MONITOR

A brief review of the basics in display hardware might be in order. In the first place, it should be stressed that monitors can respond only to the type of graphics adapter installed in the computer. Purchasers of color monitors commit themselves, therefore, to a true upgrade of the system, not just a replacement of the box on top.

Purchasers of color monitors commit themselves, therefore, to a true upgrade of the system, not just a replacement of the box on top.

First introduced among the IBM standard graphics boards, the Color/Graphics Adapter (CGA) is capable of a resolution of 640 picture elements, or pixels, by 200 lines. (Pixels are the dots of light which comprise a video screen.) At this level, the monitor can display four-color graphics as well as text. As is commonly known, however, text legibility suffers in CGA displays. At a second CGA resolution setting, 320 by 200, the number of colors possible in the display increases to 16, but the character resolution is even worse. This setting is only thought appropriate for certain game and educational software.

The Enhanced Graphics Adapter (EGA) provides for a maximum resolution of 640 by 350. EGA-compatible monitors can display up to 16 colors at once from a palette of 64. Characters are illustrated in 8 by 14-pixel boxes, an improvement over the 8 by 8 CGA standard. Upgrades of the EGA standard, such as the VEGA Deluxe developed for multiscan monitors, have boosted resolution to 640 by 480.

The IBM release named Professional Graphic Controller, or PGC, should also be mentioned in this lineup. It is capable of displaying 256 colors simultaneously at a 640 by

480 resolution. The PGC display was designed to handle higher level applications more akin to computer-aided-design (CAD), but its success has been limited. Currently there is much less software on the market which exploits the PGC than there is for the EGA display, and the PGC standard is considered to have been eclipsed by EGA enhancements.

Those buyers opting for flexibility and for the possibility of upgrading, might go for a multiscan, or multisync monitor. These boxes boast adaptability to any of the aforementioned color adapters, to other non-IBM-developed color boards such as the Hercules Graphics Card and the Persyst BOB, and to the Monochrome Display Adapter. As mentioned earlier, VEGA boards combined with these monitors increase screen resolution to 640 by 480. With even more advanced boards, the resolution can be increased to 800 by 560 or 900 by 560 on NEC and Sony boxes, respectively. According to *PC Magazine*, "If you're sure you're never going to upgrade to higher resolution, EGAs are fine. But another $200 will buy you the flexibility of a display that can handle CGA, EGA, and PGC standards for now—and maybe some future standards, too."

APPLE MACHINES

Most of this article has centered on the monitor as a specific component of IBM compatible machines. A stumbling-block of IBM-related color technology in its early incarnations involved the trade-off between high resolution, and the cost incurred to achieve it for both color and text. With its introduction to color Apple computers decided to incur the cost and provide a color monitor capable of the same graphic and textual resolution that is available on the monochrome monitors.

Color on the Macintosh II machine is incorporated in a 640 by 480 pixel video display, driven by one type of graphics board. (There aren't three like IBM.) Sixteen colors may be displayed at once with the board's 256K memory. An additional 256K of memory will increase the numbers of colors accommodated to 256.

The new Apple IIGS features several resolution modes: 320 by 200 and 640 by 200 with 4- and 16-color palettes respectively. Interesting to note is that the Apple IIGS allows the user to change palettes and resolution on a screen-by-screen or a line-by-line basis.

EVALUATING COLOR MONITORS

When evaluating any color monitor, a buyer should consider a number of practical features. First, colors vary from monitor to monitor, and so a buyer should look at the tints on the screen and be assured that the colors are, as it were, palatable. Find out to what extent default color settings can be changed. Adjust the contrast to see the range of variation, and while so doing, note where the adjustment buttons are located on the monitor. Note also whether they are easily turned or whether they require pushing or pulling that seems inconvenient.

. . .colors vary from monitor to monitor, and so a buyer should look at the tints on the screen and be assured that the colors are, as it were, palatable.

A little-noted fact involves pixels on IBM-compatible screens. Picture elements on computer monitors were first conceived for textual display, not for true image portrayal. For this reason, the actual shape of a pixel on an IBM-compatible screen is not round or square, but rectangular, since most characters in the Roman alphabet are taller than they are wide. For eventual image display, therefore, a buyer should note whether the image on the screen can be compressed to flatten out the pixels. If this feature is lacking, images displayed on the screen will appear distorted due to the pixels' elongation.

As a final note, check to see how resistant the screen is to glare, and notice to what extent the monitor can be tilted to avoid that glare or to aid in viewing. Suggestions for choosing color monitors prove plentiful in industry journals. *PC Magazine* reviewed no fewer than eighteen IBM-compatible color monitors in its March 31, 1987 issue, and in its December 1986 and April 1987 issues, *Byte* studied the Apple IIGS and the Macintosh II.

Advances in online information display allow us to liken personal computer monitors to telephones, where the monochrome display represents the rotary-dial model—a solid, but limited piece of equipment. For now, and probably for a good time to come, monochrome displays will get across the message to the masses. As image-integrated databases become affordable, though, color monitors will parallel touch-tone telephones, becoming more common over time, and allowing a vastly expanded and more widely interactive method of information transfer.

Communications to the author should be addressed to Margaret A. Cribbs, 267 N. Encinitas Avenue, Monrovia, CA 91016.

COLOR DISPLAYS AND INFORMATION RETRIEVAL

by Nancy K. Herther
Information Consultant

"Color motivates. It gets attention. If applied with its limitations and requirements in mind, color can be a powerful manipulator of our attention, memory and understanding."
(1)

Studies have documented many hazards of working at computer terminals: tired eyes, fatigue, aching muscles. The National Computer Graphics Association has even developed specifications for workstation dimensions in order to reduce these problems and improve productivity. One industrial design professor has found that:

> *"On any kind of standard monitor, people don't perform as well as they do with hardcopy in terms of how quickly they can read, how quickly they can pick out errors and how much they can remember from what they do read."(2)*

Monitors have often been an afterthought in evaluating and purchasing computer systems. Especially for organizations on limited budgets, like most libraries, buyers will choose monochrome, or single color displays, which generally sell for $500 less than the high-resolution color monitors.

For most word processing and online searching, a color monitor is not considered necessary. As long as the information is uniform, the printing legible, monochrome displays are adequate. However, for many CDROM products, a high resolution color monitor is becoming an essential part of the equipment.

Dr. Fred Zappert, part of the Dialog team which developed the software for the OnDisc CDROMs, believes that the monochrome

The Main Menu screen in DIALOG's ERIC OnDisc CDROM product allows the user to select either the traditional DIALOG searching method or the Easy Menu Search. The colors used are both attractive and informative. Courtesy of Dialog Information Services, Inc.

screens are "slowly fading into history." The new series of microcomputers recently announced by IBM, would seem to support this. The new IBMs come bundled with high resolution EGA monitors. With this support from a company as prestigious as IBM, we can expect that EGA and color monitors will become the standard in coming years.

At Dialog, color was an important ingredient in the development of the screen displays and

The use of highlighting and color is evident in this picture of the listing of "Dictionary/Thesaurus terms" selected by a user. The use of different colors helps to quickly draw the user's attention to the relevant information and helps to organize the information for faster retrieval.

In this example, note how the user can take cues from the colors used, making the display easier to read and comprehend. Slides courtesy of Dialog Information Services, Inc.

access software for OnDisc. "We wanted to make effective, consistent use of color so that the various elements on the screen could be used to their best advantage. The user would be able to have some field-to-ground relationships sorted out for them."

In making that work consistently, software engineers must carefully tie together all of the elements in the software design process to see that nothing would appear on the screen which would in fact confuse the user or lead the user to false conclusions.

Color can be important in holding the attention of the user to the information on the screen. Researchers have also found that color can increase retention of information and significantly affect our very *understanding* of information. By directing the attention of the user to particular parts of the screen or specific words or phrases, the user can save time and become more effective and efficient in using computers.

At SilverPlatter, Chris Pooley reports that user reaction to the color displays was very important during the beta testing of their products. At test sites, Pooley reports, users were all very pleased with the color enhancements to the data.

Zappert agrees on the important role of color in product design. "Our aim was to make all of the different elements that would come up on the screen *self-organizing*. Color was one important part of this process. Without color you are stuck with boxes, arrows or other crude means of delivering information."

Software engineers seem committed to using color as an important ingredient in CDROM product development for the future. The benefits are clear to any user, given the opportunity to test the products using a color monitor. Color aids in highlighting the *context* or meaning of information, and can help to speed up the process of information retrieval. Users appear to be captivated by the visual appeal of the color screens.

For printing citations from online databases or automated circulation systems, resolution quality is less important to librarians. Legibility is the key. However, with CDROM systems, especially when used by the general public, color can enhance the speed and ease of retrieval. If the system seems confusing, the patron will inevitably rely more heavily on staff assistance and will also be forced to spend more time with the system trying to decipher the information on the screens. In this way, the benefits of color monitors become clearer. Libraries planning to purchase CDROM products, need to budget for these high resolution color monitors. Color is already an important ingredient of CDROM systems and will become even more important in the future.

A BRIEF TUTORIAL TO COLOR GRAPHICS MONITORS

Manufacturers of color monitors have developed a variety of different, and incompatible, graphics protocols to fit the needs of different software packages and computer systems. Some of the more popular schemes are detailed below. The differences among the monitors relate to the color capability, screen resolution and horizontal scan rates of the monitors. The higher the resolution, the sharper and clearer the picture is on the screen. These are not the only types of monitors available today, but they are the most popular types found in libraries and information centers.

COLOR GRAPHICS ADAPTER (CGA): *Developed by IBM, this system offers 16 different color possibilities. The resolution is quite poor, however, and in the words of one software engineer, CGA "drove many people back to monochrome displays."*

MONOCHROME DISPLAY ADAPTER (MDA): *This is a single color screen design, common in most libraries, which uses the colors of black, green or amber. It has a better resolution than CGA and is often used for textual applications.*

HERCULES GRAPHICS PROTOCOL: *Developed by the Hercules Computer Technology Company, allows owners of MDA screens to upgrade their systems to support programs which need graphics as well as textual screen displays.*

EXTENDED GRAPHICS ADAPTER (EGA): *Another IBM product, EGA is the most popular standard for PC-based systems. It supports up to 64 colors and has a resolution capacity nearly equal to the MDA systems.*

DIRECT GRAPHICS INTERFACE STANDARD (DGIS): *Developed by Graphic Software Systems Inc. (Beaverton, OR) as a proposed standard, is now used on graphics boards with support from Intel, Hitachi and Texas Instruments.*

VIDEO GRAPHICS ARRAY (VGA): *IBM's new graphics array for the PS/2 microcomputers, may eventually prove to overshadow other graphics card systems.*

REFERENCES

(1) Durrett, John & Trezona, Judi. "How to use color displays effectively: A look at the elements of color vision and their implications for programmers." *BYTE* 7: 50-53, April 1982; p. 53.

(2) Rowinsky, Walt. "Quality of monitor affects productivity, comfort of workers," *PC Week* 4: 99+, January 6, 1987; pp. 101-102. And Benbasat, Izak and Albert S. Dexter, "An investigation of the effectiveness of color and graphical information presentation under varying time constraints," *MIS Quarterly*, March 1986, pp. 59-64.

ORDERING SLIDES VIA MODEM

by Dona Z. Meilach
Author and Graphics
Consultant and Presenter
Carlsbad, CA

Dealing with computer designed 35mm slides and overhead transparencies may seem like alien territory to the online professional who is accustomed to extracting information from databanks. But learning how these media wed with telecommunications could earn you title of maid of honor or best man from your employer. Or, if you sell databank services, tapping into slide-making companies via modem could be a valuable addition to your business.

The New York Market Analysis firm, Frost & Sullivan, forecasts that the computer graphics industry will be $7.6 billion in 1987 and will grow to $23.1 billion by 1992. One clearly identifiable market is for the graphics software packages that are used with personal computers.

Another industry watcher, Neil Kleinman, believes that by 1990 business graphics alone for the personal computer market will exceed $500 million. The majority of these packages will be able to produce presentations from simple chart and text slides to high level artistic output. Input devices, hardcopy peripherals, processors, software, displays and controllers, will work together to address a full range of user needs for presentations and publishing.

What has this to do with telecommunications? A large percent of these visuals and hardcopy output will be ordered over phone lines. It's economical and fast. No mail or courier can beat it. Even large companies with in-house graphics systems will use modems to network departments that will share resources.

If this all sounds like electronic fiction of the future, be assured it's happening now. In real life. In real time.

SLIDES DESIGNED ON COMPUTER ARE UPLOADED TO A SERVICE BUREAU

There are probably more than 200 graphics software packages on the market for the IBM PC, Macintosh, and Amiga, that will generate business charts, graphs, advertising art, mechanical, architectural and medical drawings, and so forth. Several packages are specifically designed for generating presentation graphics such as word charts, bar, pie, line, table charts, etc.

Pre-computer, a slide presentation involved hand drawing, typeset lettering, pasteups and photographing each art board with a camera by people with specialized skills. Every presentation was time consuming and expensive. With a computer, every PC owner can be his own slide maker.

The user designs all the slides (or overhead ►

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transparencies) for a presentation on a computer and saves the file for each slide on a disk. To make a traditional 35mm slide, the file is transferred to an "image recorder," a unit designed specifically for photographing computer images. Most image recorders have a built-in CRT, complex optics, and a built-in camera. A PC is connected to the Image Recorder and the digital image of the file is transferred to the recorder's internal CRT from which the camera takes its picture.

Image recorders improve the resolution and sharpness of the image considerably compared to the original viewed on screen. More colors can be achieved than the four, eight, or 64 normally displayed using the IBM color graphics adapter (CGA) or enhanced graphics adapter (EGA).

Do NOT confuse this procedure with using a standard camera and taking a picture of the CRT screen. Taking a picture of a CRT screen produces only the same resolution you see on screen. The photographed images may appear distorted, off color, and have glare spots from the CRT glass. You need some camera expertise to get the proper time and light exposure because of the rate at which the CRT screen refreshes.

Image recorders are expensive and their capabilities vary. The lowest priced unit is the $3000 Polaroid Palette+ that produces a low resolution slide. (Polaroid's earlier model at $2000 produced a lower resolution slide which is not acceptable by today's standards.)

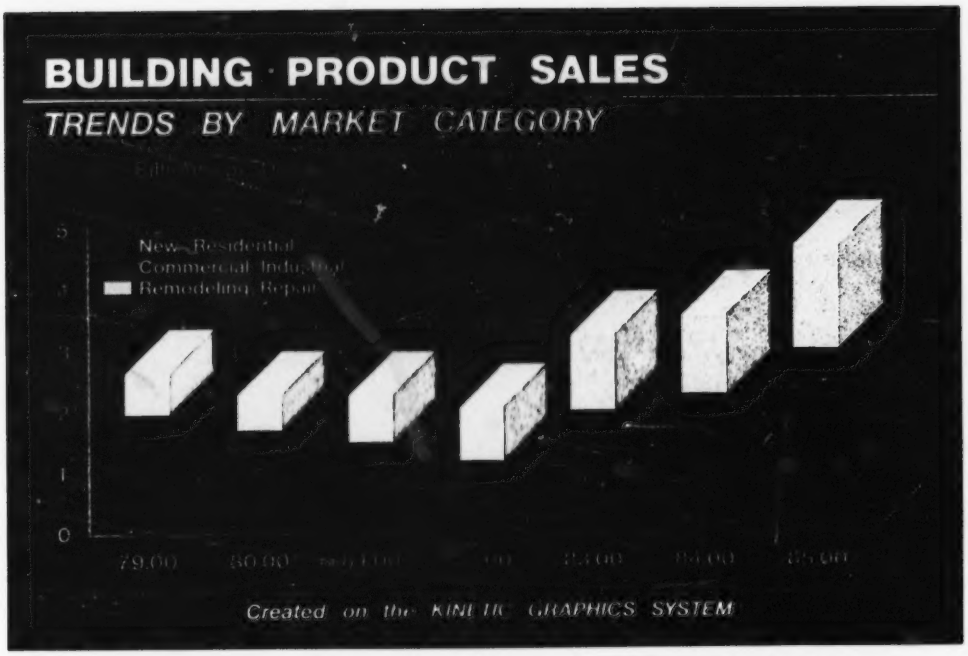
Most popular image recorders produce 2000 and 4000 line resolution. Prices range from $5000 to $35,000 and include units from Bell & Howell, Beseler, Dunn, CalComp, Hewlett-Packard, Kiron, Matrix, General Parametrics, and Management Graphics, Minneapolis. Only Presentation Technologies, Inc. offers an 8000 line resolution unit at $5000 and its technology differs from the others. Genigraphics, Celco, and others are priced from $50,000 up to $250,000 with 4000 or 8000 line resolution.

Presentation Technologies, Inc., estimates that a company that averages 20 slides per month at $75.00 per slide will have a breakeven point for their $5000 machine in under four months. So it makes sense that a company that uses presentations only occasionally, will not want to invest in an image recorder until their volume makes it cost effective. Until then, the smartest move is to take advantage of slide services that do have the necessary high quality equipment.

It was only about three years ago, that the only way to achieve computer generated slides

Ready to use maps and hundreds of other business applicable images are included in the very sophisticated software, Mirage.

Courtesy, Zenographics, Inc.



Kinetic Graphics Systems software lets you select a 3-D option for bar charts.
Courtesy, KGS

Choosing a dynamic background is easy with Graphics Express. The oil wells are added in from a library of pre-drawn images available in Graphics Express.
Courtesy, Bell & Howell

was to have them custom made by a slide service, and this is still big business. A slide service's computers can produce more sophisticated slides than those you can get on a PC. Their workstations have millions of colors, scores of fonts, and flexible drawing capabilities to produce visual effects unavailable to PC's.

Prices for a custom slide are from $18.00 (for a title only or a slide with one or two lines of type) to about $150 (for one with involved business charts, images or designs). It's not unusual for a 90 slide single projector presentation to cost $6000.

That same 90 slide presentation could be designed with one of the new slidemaking software packages, then sent to a service for imaging. The cost? Between $6.00 to $20.00 per slide regardless of what's on the slide. The software lets you select typefaces, colors and images from a library of drawings available for the non-artist. Data can be grabbed from spreadsheet files and generated instantly into any chart style needed.

What's your investment in equipment? You require a PC with the necessary graphics board and monitor, and a modem.

What's your investment in equipment? You require a PC with the necessary graphics board and monitor, and a modem. Prices for presentations graphics software are from $395 for the popular Harvard Graphics to $900 for Mirage. For high quality art reproduction there are paint programs such as Time-Arts "Lumina;" and for architecture, there's AutoCAD; both are upwards of $2000.

Once the slides are designed on computer, how do the files get to the slide service?

That computer generated slide file can be transmitted to a slide service via modem for overnight service and express delivery if you request it. Charges vary by the service used and speed at which you want the slides returned; a three day turnaround may be a little less than an overnight turnaround; though some companies offer only overnight turnaround at a basic fee. Super rush time, four hours or less will cost more. Of course, you could also mail the disk to the company with overnight or regular mail.

HERE'S HOW YOU CAN SAVE YOUR COMPANY MONEY AND BE A HERO

Recent studies by the 3M Corporation and the University of Minnesota showed that visuals have a positive effect on persuading an audience to act in the presenters' favor. It also proved that people who use visuals are perceived as more professional than those who do not.

According to the Hope Reports, a Rochester, New York service that tracks the graphics market, in 1985 an estimated 40 million more slides were used by businesses than in 1984. Of the total 620 million slides used, about 60 million, or less than 10 percent, were made with a computer. By 1990, an estimated one billion slides will be produced, 24 percent on a computer. There is also an unsurpassed sale of film and supplies used with overhead projectors, says president Tom Hope.

By 1990, an estimated one billion slides will be produced, 24 percent on a computer.

Executives in many mid and small size companies are becoming increasingly aware of the importance of visuals for a presentation. Yet how slides are generated on a computer and transposed to a 35mm format is a grey area that's hard to visualize. Your role may be to make people aware of the service and help expedite it. You, as the online professional, would be in a position to know about the service and its availability to your personnel. How would you tackle the subject?

Find out who is making presentations in your company now. Executives? Salespeople? Trainers? Learn what they are using for visuals. How sophisticated are the visuals? What is the quality? Answers will range from no visuals because "they're costly and take too much time to make" to "overhead transparencies because they're fast." However, these fast transparencies may be only typewritten and photocopied onto film. With today's audiences expecting professional visuals, those outdated typewritten transparencies can hurt more than help a presenter's image.

In a company that has an artist or art department, you can expect high quality visuals, but there's the time bugaboo. The presenter

usually has a few sessions with the artist who designs the presentation from rough notes. Roughs and proofs must be OK'd before slides are made. If there are corrections or last minute data changes, deadlines become tension time. The artist is probably involved in someone else's presentation by then.

The do-it-yourself PC user can circumvent delays and waiting in a queue for another person's slides to be made. He can implement last minute changes. He can get his slides fast and error free. . .and have the up-to-date data within 24 hours of his presentation, faster if necessary. And telecommunications are part of the story.

Here's a typical scenario: Mr. PC learns on Monday, he has to present latest sales, inventory, proposed growth statistics to an important board of directors meeting on Thursday. He begins planning his talk with pencil and paper (or on a word processor) and gathers the statistics he needs from an inventory and spreadsheet program. He wants closing figures as of Wednesday noon but he can begin planning the slides with what he has now. He can update the statistics minutes before he's ready to upload the final slides to the service.

He calls up 35mm Express, a program that will automatically generate charts and graphs from the data on his Lotus 1-2-3 program file and ready them for a slide. It also enables him to design text and title slides to string the charts together. If he's creative, he can use some of the library images and symbols to make the slide more interesting.

Wednesday afternoon, the files can be uploaded to a service before its evening deadline time. (Some work around the clock.) Those slides will be imaged instantly, developed, billed, and packaged to make a late evening overnight mail pick up service. Mr. PC will have his slides ready to load in a carousel by ten on Thursday morning.

WHAT DOES IT REQUIRE?
WHAT DO YOU GET?

Telecommunications takes experience which the average PC user may not have. You, the telecommunications professional, are in a position to teach others how to do it. If adding that responsibility to your job is too much, consider bringing in a communications secretary. Among companies that have integrated visuals, some hire one person with graphics capability to facilitate slidemaking and desktop publishing procedures. This person is not expected to do the slides, but he may be expected to guide the creation of them, check for possible typos, then upload the finished files and keep track of billing. The same person may be involved in desktop publishing, too.

Slide services work either from popular software packages, or require that you use their software. Brilliant Image Inc., NY will create visuals in any time frame from a few hours to three days using off-the-shelf software: Harvard Graphics, Lotus 1-2-3, Freelance Plus, Mirage, Autumn, Microsoft Chart, Graphics Express, Impressionist, and others. The company's artists can enhance a slide at an additional charge.

Brilliant Image will accept files two ways: 1) By direct PC to PC transfer using any modem communications package with an XMODEM, Kermit or X.PC protocol; or 2) through an MCI Mail account using a customized version of Electronic Envelope (MCTel). Images and spreadsheet files are binary files and require special handling to change them into the ASCII files that e-mail can transmit.

MAGICorp also images slides from a number of popular packages. 35mm Express, and Harvard Graphics for example, include the modem software required to send files to MAGICorp in Elmsford, NY. After you open an account with MAGICorp, you only have to select the communications menu, fill in your user name and account number, select send. . . and the files are on their way. Other packages require MAGICorp's inexpensive custom communications package that has a driver to its image recorder.

Stanley Feinberg, president of Visual Horizons, Rochester, NY, a full service photographic company, says, "There must be thousands of executives who go back to the office on Saturday afternoon and prepare their presentations when it's quiet. Our computers are filled with slide orders on Monday morning. Orders come from Fortune 1000 executives, salesmen, school teachers, engineers, and medical people throughout the country."

The majority of slide-making services require that you use their graphics package. Genigraphics, Inc., with slide-making centers throughout the country, offers Graftime, a $295 program for your PC. With it you can design title, text and a variety of business charts. Graftime has a choice of four fonts and a variety of background and foreground colors. . . but nothing fancy. Each slide will cost $10 when you send it to them via modem, plus next day shipping charges.

If you choose, you can ask Genigraphics to enhance that slide by requesting a fancier background, perhaps shaded top to bottom, a grid, different typefaces, drop shadows, or images. You might want the picture of an oil rig on a slide that shows data about the oil industry. Genigraphics provides a book of predesigned slides which you can order as the

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basis for your data or text. These will cost more, per slide, than the plain vanilla variety, but not as much as a fully customized slide. Other service companies that have similar arrangements are Artronics, Autographix, Dicomed, Management Graphics Minneapolis, National Slidemakers, 3M and Telex.

Several companies are trying to establish modem-in, walk-in, mail-in service centers for computer generated slides similar to your neighborhood photo processing lab. Management Graphics Inc., Toronto, uses Xerox or other service centers in Canada or the U.S. The software required is their $295.00 (Canada) $249.00 (U.S.) package, Slideworks, aimed at presentation needs. It has seven typefaces, several languages, drawing features such as boxes, circles, ellipses and lines. It offers template guides, preformatted charts and recommended color combinations to prevent the user from putting too many elements, too many colors in one slide, or one presentation.

Kinetic Graphics Systems (KGS) offers software modules that integrate word processing, slide making and layout capability for text and graphics. KGS is establishing Presentation Centers for production of slides, overhead transparencies or other media, within 24 hours, to try to grab a chunk of the expanding presentation graphics market.

National Slidemakers has Expresslide that lets you design a slide, send it via modem to one of two branches, and have the slide on your desk within 24 hours. Cost per slide is $9.95.

National Slidemakers has Expresslide that lets you design a slide, send it via modem to one of two branches, and have the slide on your desk within 24 hours. Cost per slide is $9.95. You can achieve several exciting special effects that usually are found only in custom slides. They support 35mm Express, too.

WHAT QUALITY AND KIND OF OUTPUT?

Services will provide you with any type of visual you need in film or hardcopy, in black and white and color. The quality will depend on the image recorder and printing equipment used by the service. Slide resolution, mentioned above, is a function of the image recorder optics, the camera and film used.

Once you have a color overhead transparency made by a service, you will probably never again be satisfied with typewritten black and white overheads. The impact of large, easy to read lettering, images, and color, on an audience is stunning and well worth the $6.00 to about $25.00 each it may cost to have them made.

New thermal transfer printers such as the CalComp ColorMaster and the Matrix TT200, are being installed by service bureaus to produce striking color prints that will replicate the slides. Service bureaus charge from $6.00 to $15.00 for a color printout. But the printers, priced at $5000 to $6000, are affordable and will print directly on transparency film as well as paper. When used in-house as a shared resource, the cost per copy is closer to thirty-five cents each. The same files used to make slides are sent to the printer providing the software has the necessary printer driver. Files can also be sent to laser printers using software that supports them, but output is black and white.

The corporate online professional can make a valuable contribution by apprising executives of slide services and their potential impact on the company. It could spark the beginning, or increased use, of visual presentations. Companies that rely on visuals for presentations generally forge ahead of non-visual competitors.

The individual who offers online services to others may discover new business opportunities with slide making. You might bring in a designer who can enhance the basic visuals developed by a PC user, then upload them for imaging. You could offer a scaled down version of a custom slide service. You've already got corporate customers. . . slide making from a PC may be another extra that will help them and you.

Ordering visuals online is a booming business. Its potential and rich lode has hardly been touched. Learning about it and sharing your information can open infinite new opportunities for you and your company.

SOURCES FOR INFORMATION

COMPANIES THAT MARKET IMAGE RECORDERS

Bell & Howell
Quintar Division
411 Amapola Ave.
Torrance, CA 90501-1493
213/320-5700.

Beseler Film Recorder
8 Fernwood Rd.
Florham Park, NJ 07932
210/822-1000.

Celco-Constantine Engineering Labs. Co.
70 Constantine Drive
Mahway, NJ 07430
201/327-1123.

Data Innovations, Inc.
323 New Boston Street
Wilmington, MA 01887
617/933-8170.

Dunn Instruments
7001 Loisdale Dr.
Springfield, VA 22150
703/992-4600

General Parametrics Corp.
1505 Solano Ave.
Berkeley, CA 94707
415/524-3950.

Genigraphics Corp.
P.O. Box 591
Liverpool, NY 13088
315/451-6600.

Hewlett-Packard
16399 W. Bernardo Dr.
San Diego, CA 92127
619/487-4100.

CalComp
2411 West LaPalma Avenue
Anaheim, CA 92801
800/CAL-COMP.

KIRON Corp
730 E. Kings Hill Pl.
Carson, CA 90746
213/515-0293.

Lang Systems, Inc.
1010 O'Brien Dr.
Menlo Park, CA 94025
415/328-5555
TLX 17-2577 (LANG SYS MNPK).

Management Graphics, Minneapolis
1401 E. 79th St.
Minneapolis, MN 55420
612/854-1220.

Matrix Instruments Inc.
1 Ramland Rd.
Orangeburg, NY 10962
914/365-0190
TLX 685-3232.

NISE, Inc.
20018 State Rd.
Cerritos, CA 90701
213/860-6708.

Polaroid Corp.
575 Technology Square
Cambridge, MA 02139
617/577-2000
800/225-1618.

Presentation Technologies Inc.
743 North Pastoria Ave.
Sunnyvale, CA 94086
408/749-1959.

SLIDE MAKING SERVICES

Artronics, Inc.
300 Corporate Court
South Plainfield, NJ 07080
201/756-6868.

Autographix, Inc.
100 Fifth Ave.
Waltham, MA 02154
617/890-8558
Service centers in Boston, NY, Chicago, Dallas, Los Angeles.

Audio Visual Division/3M
225-3NE 3M Center
St. Paul, MN 55144
612/736-1285.

AVL Inc.
56 Park Rd.
Tinton Falls, NJ 07724
201/544-8700
800/223-0213
TWX 710-772-9499.

Brilliant Image, Inc.
141 W. 28th St.
New York, NY 10001
212/736-9661.

Caramate Visual Master and In-House Graphics System
Telex Communications Inc.
9600 Aldrich Ave. S.
Minneapolis, MN 55420
612/884-4051
800/828-6107
TLX 297053 (TELEXCOMDI MPS).

Chartmasters, Inc.
1750 Montgomery St.
San Francisco, CA 94111
415/421-6630
Centers in Atlanta, GA, Chicago, IL, San Francisco, CA, Santa Clara, CA.

Dicomed Corp
P.O. Box 246
Minneapolis, MN 55440
612/885-3000
TLX 290837
Service centers in several cities. Check local phone book or write or call for service nearest you.

Genigraphics Corp.
4806 W. Taft Rd.

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P.O. Box 591
Liverpool, NY 13088
315/451-6600
Service centers in several cities. Check local phone book or write or call for service nearest you.

Kinetic Graphics Systems
Kinetic Presentations Inc.
Distillery Commons 250
Louisville, KY 40206
502/583-1679.

MAGICorp
50 Executive Blvd.
Elmsford, NY 10523
800/FOR-MAGI.

Management Graphics Inc. of Toronto, Canada
1450 Lodestar Road, Unit-1
Downsview, Ontario, Canada M3J3C1
416/638-8877
Centers in Ottawa and U.S. Check phone book or write or call for nearest location.

National Slidemakers
1130 Rte. 22, Westbound
Mountainside, NJ 07092
201/789-8500.

Visual Horizons
180 Metro Park
Rochester, NY 14623
716/424-5300
TLX 978478.

Xerox Reproduction Centers
Offering Xerox 350 Color Slide System.

SOFTWARE COMPANIES MENTIONED

These are representative packages. There are many more programs from which slides can be generated providing there are drivers to the image recorders used by the slide service. Check on this before you invest money and time in software. A few companies will image from Amiga, Apple, and Macintosh software.

35mm Express
Business & Professional Software, Inc.
143 Binney St.
Cambridge, MA 02142
617/491-3377.

AutoCAD
Autodesk Inc.
2320 Marinship Way
Sausalito, CA 94965
415/332-2344.

Autumn & Mirage
Zenographics
19752 MacArthur Blvd. Ste. 250
Irvine, CA 92715
714/851-6352.

Electronic Envelope
MCTel
5070 Paradise Ste. 13200
Philadelphia, PA 19131
215/874-3819.

Freelance Plus
(See Lotus Corp.)

GrafTime
(See Genigraphics Corp.)

THE POLAROID PALETTE PLUS: FROM COLOR MONITORS TO COLOR SLIDES

by Anthony R. Kwak, Ed.D.
Learning Resources Division
Louise Darling Biomedical Library
University of California, Los Angeles

Ever wish you could have slides or photographs of your computer displays to use for teaching, training, displays, or publications? Converting computer screen images into slides for use on commonly accessible slide projectors or into photographs is relatively simple. The most convenient and certainly least expensive method is to use a 35mm camera equipped with a macro lens and a tripod to take pictures of screen displays. However, the quality will be no better than the screen you are shooting, which is marginally acceptable for many applications, and considerable patience is needed to frame, align, and expose each image correctly.

A more convenient and efficient, although a bit more expensive method, is to use a computer image or film recorder, such as the Polaroid Palette Plus. Film recorders typically take the output directly from a color/graphics monitor, enhance the image and process it for a special camera attached to the recorder unit.

The Polaroid Palette Plus is a particularly affordable and easy-to-use system which is compatible with IBM color/graphics (CGA) or enhanced graphics adapters (EGA) as well as several others. (An earlier model, the Polaroid Palette, is CGA compatible only.) It includes special camera adapters for conventional 35mm film and for Polaroid instant films. Programs for capturing images from your screen, modifying the color palettes, controlling the exposure times, and for batch processing a number of images at once, are included on a disk that accompa-

Graphics Express
(See Bell & Howell)

Harvard Graphics
Software Publishing Corp.
P.O. Box 7210
1901 Landings Dr.
Mountain View, CA 94039
415/962-8910.

Impressionist
Execucom Systems Corp.
3410 Far West Blvd.
Austin, TX 73781
512/346-4980.

Expresslide
(See National Slidemakers)

Lotus 1-2-3
Lotus Development Corp.
161 First Ave.
Cambridge, MA 02142
617/494-1270.

Lumena
Time Arts Inc.
3436 Mendocino Ave.
P.O. Box 6476
San Rosa, CA 95401
707/576-7722.

MicroSoft Chart
Microsoft Corp.
10700 Northup Way
Bellevue, WA 98009
206/828-8080.

Mirage (See Autumn).

Slideworks
(See Management Graphics Inc., Toronto).

THE AUTHOR

DONA Z. MEILACH is the author of *DYNAMICS OF PRESENTATION GRAPHICS*, (Dow Jones Irwin) and more than 60 other books. She is a contributing editor to *Computer Graphics Today Magazine* and a frequent contributor to *PC WEEK, PC Magazine, Lotus Magazine, InfoWorld* and other publications. She consults on computer graphics and presents workshops for corporate clients and at conferences.

Communications to the author can be sent through MCI Mail, 297-0943 or to Dona Z. Meilach, CompuWrite.*, 2018 Saliente Way, Carlsbad, CA 92009; 619/436-4395.

nies the unit. Additionally, the system is capable of producing slides of up to 640 x 700 resolution in as many as 72 colors. A 35mm instant slide processor and slide mounter is included in the system.

Literally any image that can be displayed on a CGA or EGA display, color or monochrome, can be captured and processed into color slides or color or black and white photographs. Slides can be created to demonstrate the use of application programs, such as, word processing, spreadsheet, database, or telecommunications programs. Paint, draw, business graphics, and other color graphics programs can be used to create images with the specific purpose of creating slides of graphs, charts, artwork, titles, and so on.

The Polaroid Palette Plus is only one of several inexpensive ($3000 and under) film recorders. Recorders can cost much more for very sophisticated, high quality systems with slide resolution as high as 4000 lines. The Polaroid Palette Plus, however, is an easy to use, flexible, and affordable system that produces slides of reasonable quality. It is capable of handling instant color and black and white prints, instant color slides or normal 35mm color slides.

When slides or photographs of computer display images are needed for educational, training, display, or publication purposes, a film recorder such as the Polaroid Palette Plus can be an indispensable tool. (See examples of the slides prepared using the Polaroid Palette Plus on page 117 in this special color Library Micro Section of *ONLINE*.)

Communications to the author should be addressed to Anthony R. Kwak, Ed.D., Learning Resources Division, Louise Darling Biomedical Library, UCLA Center for the Health Sciences, 10833 Le Conte Avenue, Los Angeles, CA 90024-1798; 213/825-3034.

software pick of the month

by Paula Hane
Editor, SOFT

This month begins what will be a regular feature in both *ONLINE* and *DATABASE* magazines. One program will be chosen each month to be brought to the attention of our readers. The record for that program will be printed from the **SOFT** database. In addition, several other software packages will be listed, with producer information, to advise readers about noteworthy releases. A full description of each package can be found in file SOFT on BRS.

This month's choice, CROSSTALK Mk. 4, is an updated and enhanced version of a long-time classic communications program, CROSSTALK XVI. If you have need for concurrent communications and are willing to tackle the command language, perhaps this is the program for you.

AN ACC NUMBER: 7267. 8709.
SN SOFTWARE NAME ..... **CROSSTALK MK. 4**
Version 1.0
Date Released 1987
Cost ..... $245.
AD Name ..... Crosstalk Communications Division of Digital Communications Associates Inc.
Street ..... 1000 Holcomb Woods Parkway
City, St., Zip ..... Roswell, GA 30076
Phone ..... (404) 998-3998; (800) 241-6393
AP APPLICATION ..... COMMUNICATIONS, GENERAL PURPOSE, TERMINAL EMULATION.
PD PRODUCT DESCRIPTION ..... A full-featured, versatile communications program that offers a menu interface for beginners, and a powerful programming language to create customized scripts for advanced users. Offers up to 15 concurrent communications sessions, each in its own window or on separate "pages." Emulates more than a dozen terminals; supports most file transfer protocols; allows more than 50 programmable function keys. The programming language, called Crosstalk Application Script Language (CASL), includes an editor, compiler and more than 300 commands, functions and statements. Not copy protected.
OS OPERATING ENVIRONMENT
Operating System(s) ..... MSDOS or PCDOS 2.0 or later
HD HARDWARE REQUIREMENTS .....IBM PC, XT, AT or compatibles; 256K RAM; one floppy drive; supports most popular modems.
DO DOCUMENTATION .....424 page printed manual. Telephone technical support free to registered users.
SR SOFTWARE REVIEWS .....
MAGAZINE NAME: *InfoWorld*
ARTICLE TITLE: Powerhouse Program Offers Features, Versatility.
REVIEWER NAME: Tapanila, Glen and Tom Bigley
DATE: June 29, 1987
VOLUME: 9
NUMBER: 26
PAGES: 41-44
COMMENTS: Very good overall rating with excellent performance. Rated very good for ease of learning and use. The documentation is satisfactory, but would profit from a quick reference guide and tutorial material. More expensive than other basic communications packages but worth the price for the number of features.

NOTEWORTHY RELEASES

ASKSAM. version 3.02. $200.
Seaside Software Inc.
P.O. Box 31
Perry, FL 32347
(904) 584-6590; (800) 327-5726
A text based management system for IBM's.

DESQVIEW. version 2.0. $129.95
Quarterdeck Office Systems
150 Pico Blvd.
Santa Monica, CA 90405
(213) 392-9851
A multitasking, windowing system for IBM's that is easy to use.

FOXBASE +. version 1.20. $395. single user; $595. multiuser.
Fox Software Inc.
27493 Holiday Lane
Perrysburg, OH 43551
(419) 874-0162
A database management program that is dBase III Plus compatible, but runs faster, for IBM's. Not for novices.

NORTON UTILITIES ADVANCED EDITION. $150.
Peter Norton Computing
2210 Wilshire Blvd., Suite 186
Santa Monica, CA 90403
(213) 453-2361
An upgrade of the popular DOS utilities, for IBM's.

Communications to the editor of SOFT should be addressed to Paula Hane, Lakeview Terrace, Box 153, Amawalk, NY 10501. OnTyme—CLASS.ONLINEPH.

SOURCE CODE

by Paul W. Kittle
Director of Medical Libraries
Adventist Health Systems
Loma Linda

A ROUTING ROUTINE WITH dBASE

Due to our column width it has been necessary in this program to insert a comment regarding the number of spaces that should be included in some program lines when typing the program, i.e. (26 spaces). Leave the recommended number of spaces in your program line when typing it, for the best format. These comments are in italics, to distinguish them from the program content.

Neither Online, Inc. nor the author are responsible for loss of data as a result of using any published program. It is the responsibility of the end-user to verify the appropriateness of this and other "freeware" programs. NG

Routing is something all information specialists seem to do at some point or another. The routines presented in this issue's column may help route articles, journals, books or other items to multiple recipients. This program will generate routing forms on printer, view routing recipients, and edit/add routing recipients.

Routing can be a challenge to the information center. With a variety of material that must be sent out and different tracking sequences for each, it is often important and necessary to have a mechanism for generating routing slips automatically. In the Medical Center at Loma Linda, the way we must route materials made the need for a routing routine apparent. A number of complete journals are routed to Medical Center departments, along with the usual table of contents requests.

We needed a method and mechanism of tracking these materials. The information needed included: who gets it, what do they get, i.e. entire issue or table of contents, and where are they located, mail delivery-wise. To achieve this, a field structure needed separate first and last names, the instruction field, and the location fields. The location fields were broken down to department name, room number, and building number or name. Given this information, we then needed a method of indexing the routing data itself, and a method whereby the main system could check for routing during the serials control. In our situation we chose the UI or the Unique Identifier assigned by the National Library of Medicine. For facilities or libraries not using the UI, I suggest using the ISSN in this field. This allows for a unique number that the program will use to identify which journal goes to what recipient. An index file indexed on the last name is used for this function.

This routine may be incorporated in your in-house program, as long as you include some type of unique identifier field. This identifier must be in the data field of your journals or books or whatever you are routing. It is the hook field that looks to other files for information. The routine allows the adding and editing of individuals to whom material is routed. It also allows the viewing of that list to verify to whom materials are to be sent. Finally the routine allows the printing of routing forms. The routing forms can be altered to your taste. As written, the form may be cut off and attached, should one desire, to the material being routed. ►

Data Structure of ROUT.DBF

NAME	TYPE	WIDTH	
UI	C	12	Unique identifier
INST	C	40	Instructions
FN	C	12	First Name
LN	C	24	Last Name
DEPT	C	24	Recipient's department
RM	C	08	Recipient's Room Number
LOC	C	30	Recipient's Building

The indexes are ROUT.NDX, which is indexed on UI + LN, and ROUTNM.NDX, which is indexed on LN + FN + UI.

```
* 03/31/87 ROUT.PRG WRITTEN BY P.W. KITTLE
* written in dBASE III+
* copyright P. Kittle and Online, Inc.
* Permission is hereby granted for use providing this copyright
* acknowledgment is included. Changes may also be made to the
* code, provide acknowledgment is included. Neither P.Kittle
* nor Online, Inc. are responsible for any results, etc. from
* using this code.
CLEA GETS
STOR '@' TO LSDI
STOR 'Y' TO LADD
@ 22,3 SAY CHR(7)
@ 22,3 SAY '(18 spaces) Checking for Routing Recipients. . . (14 spaces)'
USE ROUT INDE ROUT
FIND &LUI
IF (EOF() .OR. BOF())
@ 22,3 SAY '(2 spaces) I find no Routing recipients, Do you wish to Add some? (Y/N) (4 spaces)'
SET CONS OFF
WAIT TO LADD
SET CONS ON
@ 22,3 SAY '(31 spaces) Ok. . . (30 spaces)'
STOR UPPER(LADD) TO LADD
ENDI
IF LADD = 'Y'
DO WHILE LSDI # '
STOR 13 TO LP
DO WHIL LP <= 19
@ LP,5 SAY '(66 spaces)'
STOR LP + 1 TO LP
ENDD
@ 13,15 SAY '(42 spaces)'
@ 14,15 SAY '1 - Generate Routing Forms on Printer (5 spaces)'
@ 15,15 SAY '2 - View Routing Recipients (15 spaces)'
@ 16,15 SAY '3 - Edit/Add Routing Recipients (11 spaces)'
@ 22,3 SAY '(15 spaces) Please Press the NUMBER of Your Choice (13 spaces)'
SET CONS OFF
WAIT TO LSDI
SET CONS ON
STOR UPPER(LSDI) TO LSDI
DO CASE
CASE LSDI = '1'
@ 22,3 SAY '(12 spaces) Information should be going to the Printer (11 spaces)'
USE ROUT INDE ROUT
FIND &LUI
IF .NOT. (EOF() .OR. BOF())
SET CONS OFF
SET PRIN ON
DO WHIL UI = &LUI .AND. .NOT. EOF()
? '(2 spaces)'
```

```
? '=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-='
? '(2 spaces)'
? ' Journal Title: '
? LTI
? ' '
? ' Send To : ' + TRIM(FN) + '  '+ TRIM(LN)
? ' at: ' + TRIM(DEPT) + '  ' + TRIM(LOC) + '  ' + TRIM(RM)
? ' '
? 'From: (2 spaces)' + G12
? 'Instructions: ' + INST
? ' '
? '=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-='
SKIP
ENDD
ELSE
@ 22,3 SAY '(16 spaces) Sorry, I am unable to find any instructions. . . (3 spaces)'
ENDI
SET PRIN OFF
SET CONS ON
CASE LSDI = '2'
STOR 13 TO LP
DO WHIL LP <= 18
@ LP,5 SAY '(65 spaces)'
STOR LP+1 TO LP
ENDD
USE ROUT INDE ROUT
FIND &LUI
STOR 13 TO LP
STOR '@' TO LD
DO WHIL UI=LUI .AND. LD # 'N' .AND. .NOT. EOF()
DO WHIL UI=LUI .AND. LP <=18 .AND. .NOT. EOF()
@ LP,9 SAY INST
@ LP+1,12 SAY TRIM(FN)+'  '+TRIM(LN)+'  '+TRIM(DEPT)
@LP+2,12 SAY TRIM(LOC)+'  '+ TRIM(RM)
STOR LP+4 TO LP
SKIP
ENDD
IF LP >= 18
@ 22,3 SAY '(8 spaces) There may be MORE, would you like them displayed? (Y/N) (85 spaces)'
SET CONS OFF
WAIT TO LD
SET CONS ON
STOR UPPER(LD) TO LD
IF LD = 'Y'
STOR 13 TO LP
DO WHIL LP <=19
@ LP,5 SAY '(65 spaces)'
STOR LP + 1 TO LP
ENDD
STOR 13 TO LP
ENDI
ENDI
ENDD
STOR 13 TO LP
@ 22,3 SAY '(23 spaces) Press RETURN to continue (19 spaces)'
SET CONS OFF
WAIT TO L
SET CONS ON
DO WHIL LP <= 19
@ LP,5 SAY '(65 spaces)'
STOR LP+1 TO LP
ENDD
RETU
CASE LSDI = '3'
@ 22,3 SAY '(23 spaces) ADD or EDIT? (A/E) (22 spaces)'
SET CONS OFF
WAIT TO LP
SET CONS ON
STOR UPPER(LP) TO LP
@ 22,3 SAY '(65 spaces)'
DO CASE
CASE LP = 'A'
@ 12,0 to 20,79 DOUBLE
STOR 13 TO LP
DO WHILE LP <= 19
@ LP,5 SAY '(65 spaces)'
```

►

```
STOR LP+1 TO LP
ENDD
STOR '(12 spaces)' TO LFN
STOR LFN+LFN TO LLN,LDEPT
STOR '(41 spaces)' TO LINST
STOR '(30 spaces)' TO LLOC
STOR '(8 spaces)' TO LRM
@ 14,5 SAY 'Instructions:  '
@ 14,19 GET LINST
@ 15,5 SAY 'First Name:  '
@ 15,17 GET LFN
@ 15,31 SAY 'Last Name:  '
@ 15,42 GET LLN
@ 16,5 SAY 'Department:  '
@ 16,17 GET LDEPT
@ 17,5 SAY 'Room:  '
@ 17,11 GET LRM
@ 17,20 SAY 'Location:  '
@ 17,30 GET LLOC
READ
@ 22,3 SAY '(18 spaces) Shall I SAVE this NEW Record? (Y/N) (12 spaces)'
SET CONS OFF
WAIT TO LP
SET CONS ON
IF LP = 'Y'
@ 22,3 SAY '(19 spaces) Saving your NEW record!! (20 spaces)'
USE ROUT INDE ROUT,ROUTNM
APPE BLAN
REPL UI WITH LUI,INST WITH LINST,FN WITH LFN,LN WITH LLN,DEPT WITH LDEPT
REPL RM WITH LRM,LOC WITH LLOC
RELE LINST
RELE LFN
RELE LLN
RELE LDEPT
RELE LRM
RELE LLOC
ENDI
@ 22,3 SAY '(65 spaces)'
CASE LP = 'E'
STOR 13 TO LP
DO WHIL LP <= 19
@ LP,5 SAY '(65 spaces)'
STOR LP + 1 TO LP
ENDD
STOR '(14 spaces)' TO LLN
@ 22,3 SAY '(12 spaces) Last Name of the Person to Edit? (24 spaces)'
@ 22,47 GET LLN
READ
STOR UPPER(LLN) TO LLN
STOR TRIM(LLN) TO LLN
@ 22,3 SAY '(2 spaces) Ok, Let me see if I can find ' + LLN + ' for you. . . (12 spaces)'
STOR '@' TO LP
USE ROUT INDE ROUTNM
FIND &LLN
IF .NOT. (EOF() .OR. BOF())
DO WHIL LP # 'Y' .AND. .NOT. EOF()
IF UI = &LUI .AND. LP # 'Y'
DO WHIL LN=LLN .AND. LP # 'Y' .AND. .NOT. EOF()
STOR '(12 spaces)' TO LUI, LFN
STOR LUI+LUI TO LLN,LDEPT
STOR '(40 spaces)' TO LINST
STOR '(30 spaces)' TO LLOC
STOR '(8 spaces)' TO LRM
STOR INST TO LINST
STOR UI TO LUI
STOR LN TO LLN
STOR FN TO LFN
STOR DEPT TO LDEPT
STOR RM TO LRM
STOR LOC TO LLOC
@ 14,5 SAY 'Instructions:  '
@ 14,19 GET LINST
@ 15,5 SAY 'First Name:  '
@ 15,17 GET LFN
@ 15,31 SAY 'Last Name:  '
@ 15,42 GET LLN
```

```
@ 16,5 SAY 'Department:  '
@ 16,17 GET LDEPT
@ 17,5 SAY 'Room:  '
@ 17,11 GET LRM
@ 17,20 SAY 'Location:  '
@ 17,30 GET LLOC
@ 22,3 SAY '(16 spaces) Is this the correct one to EDIT? (Y/N) (7 spaces)'
SET CONS OFF
WAIT TO LP
SET CONS ON
STOR UPPER(LP) TO LP
IF LP # 'Y'
SKIP
ELSE
ENDI
ENDD
ELSE
SKIP
ENDI
ENDD
READ
IF LINST = '  '
STOR UI TO LUI
IF LUI = &LUI
STOR RECNO() TO LNOR
@ 22,3 SAY '(20 spaces) Shall I DELETE this Record? (Y/N) (12 spaces)'
SET CONS OFF
WAIT TO LP
SET CONS ON
STOR UPPER(LP) TO LP
IF LP = 'Y'
@ 22,3 SAY '(20 spaces) Deleting that Record & Reindexing. . . . .(7 spaces)'
DELE ALL FOR # = LNOR
USE ROUT INDE ROUT,ROUTNM
PACK
ENDI
ELSE
SKIP
ENDI
ELSE
@ 22,3 SAY '(19 spaces) Shall I SAVE this new Record? (Y/N) (11 spaces)'
SET CONS OFF
WAIT TO LP
SET CONS ON
IF LP = 'Y'
@ 22,3 SAY '(24 spaces) Ok! Saving this NEW Record!! (13 spaces)'
REPL UI WITH LUI,INST WITH LINST,FN WITH LFN,LN WITH LLN,DEPT WITH LDEPT
REPL RM WITH LRM,LOC WITH LLOC
ENDI
ENDI
ENDI
ENDC
ENDC
ENDD
@ 22,3 SAY '(6 spaces) A moment or two while I reindex & update the ROUTING File. . .'
USE ROUT INDE ROUT,ROUTNM
REIN
ENDI
RETU
```

A last word for this month. Thank you for your letters, comments, and suggestions on the code that has been published. Please remember to always acknowledge *DATABASE* and myself when you use the code. Thanks again, and as always, happy programming!!

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UPGRADING THE PC/XT/AT TO MINICOMPUTER POWER

by John C. Blair, Jr.
President
Information Specialists in Systems Analysis

THE OFF-THE-SHELF PC

No matter where you may have bought your PC, chances are that it came with whatever the dealer decided to put in it in terms of memory (RAM) and storage (disks). The dealer also probably included his standard (that is, cheapest in cost for him) monitor and keyboard. The sad fact is that very few dealers make it clear that the PC and the "100% compatibles," such as the Compaq micro and the AT&T 6300, can actually be configured several different ways. For instance, the hard disk that is put in the PC is very often a very slow one and with a number of "bad sectors" that are simply mapped around when formatting takes place. However, there are very fast hard disks that are of high quality (relatively few bad sectors) which a dealer could install in the first place.

The monitor that comes with many PC's can be anywhere from reasonable quality (easy to read) to atrocious (gives you a headache). There are excellent monitors available that don't jitter or distort or glare. Likewise, there are special video display adapters to drive the monitor. These special circuit cards, sometimes called "graphics adapters," are what actually generate the character or font sets that show up on the monitor. There are a number on the market. For monochrome, the standard is the card by Hercules. For color, a number of cards have come out, called Enhanced Graphics Adapters or EGA cards. There are some ten well-known EGA cards (for a complete evaluation see the August 1986 issue of *PC Magazine*). Basically what they do is to produce a character or font on the screen that is twice as clear and easy to read as normal characters. This means quite a bit to those of us who stare at CRT's most of our waking hours. They also allow beautiful "paint" programs to run, rivaling anything Walt Disney ever did.

In short, a dealer could give you a price on a basic "box" and then allow you to choose the components that make up the working system. In order to maintain their profit margins and to make their lives much simpler, very few dealers mention such options. So, let's assume that you have already bought a PC and have discovered that it is bogging down with all the things that you want it to do. What can you do to make that overworked PC perk up and act like a minicomputer (which is what you would have bought in the first place if you had enough money)?

MEMORY UPGRADES

All of us sometimes feel like we are losing our memory, but micros are less embarrassed about it and often just flash an error message, saying "out of memory" or "program too large for memory" or some such unabashed admission. Luckily we can do something about the micro's memory. Memory chips can be added to the basic PC motherboard (up to 640K). An AT can handle up to 4 MB (megabytes), but more commonly comes with 1 MB. How do you get the chips and add them? You can either pay the dealer to do it or do it yourself by ordering a set of chips from one of the many firms who advertise in *Byte* and *PC Magazine*. If you install them, you will probably save about half the "retail" price. However, if you have never put chips on a circuit board before, you may choose to have the dealer do it. It's not difficult to install the chips. You don't even need a

soldering gun. But you do have to put them in a certain position and be careful not to bend or break their little legs (the pins coming out of them that insert into the board).

I recently upgraded a memory board to 1.5 MB, bringing the total memory up to a little over 2 MB—which is what minicomputers often come with in their initial configuration. In an AT clone (PC Designs), I am currently running XENIX/UNIX with a 4 MB of fast RAM from Computer Peripherals. This extra memory takes over from the basic 640K of a PC/XT/AT, depending on the software, to store one program while you work on another. Some software will automatically "load into" whatever *expanded* memory is available. On an AT, you can use what is called *extended* memory. I could have added two more megabytes on just one other extra board. But there comes a point at which the micro will only hold so many boards and you don't want to throw away such goodies as your Hayes internal modem or your EGA color graphics card. The upgrade took about an hour to do while I was watching television and talking to my wife. The point is that it really is not that hard to do.

HARD DISK UPGRADES

Have you noticed that your data seems to take longer and longer to get to and from the disk? The reason may be that parts of files are scattered around the disk and that your program has to run frantically all over the place, trying to find all of its pieces, every time you invoke it. There are "disk optimization" packages that help keep all the pieces together for faster access, but in all likelihood you need a higher capacity and faster disk. Another disk often means one that is not built into the original cabinet. The cabinet that came with your PC probably already has a half height floppy and a half height hard disk. An AT can have a full height drive, such as the Seagate 4038 (30 MB), 4051 (40 MB), or the 4096 (80 MB). The other reason to go with an external disk, besides not having enough space in your cabinet, is to have an external power supply to supplement the one in the computer. As you add cards, such as internal modems and graphics adapters, you tax the power supply more and more. It's a good idea to have an external power supply for the hard disk and a fan. Some AT clones (Intel 80286 CPU, often referred to as "286 machines") have a hefty power supply of 220 watts, which is more than sufficient for any add-on cards. The original half height hard disk in your cabinet very likely was not more than 20 MB and probably had an average access time of anywhere from 85 to 100 milliseconds (ms). The external add-ons can be 40 to 100 MB (or even more if you want to make a long-term investment) and have an average access time of under 30 ms.

The Paradise Systems AutoSwitch EGA Card for the IBM PC family and compatibles enables you to have CGA and EGA programs on the same color monitor.

Furthermore, the newer add-on disks come with a special "controller" that can compress the data and transfer it at twice the slower speed of other controllers. These controllers may use what is known as Run Length Limited or RLL coding (developed by IBM for larger machines). Unfortunately, older and lower quality disks cannot have the newer controller put on them. The RLL technology requires a very high quality disk or else it will eventually produce transfer errors and cause a loss of data. RLL, however, still uses an older interface standard, known as the ST506. There are other interfaces, such as SCSI and EDSI, which allow for 10 megabit transfers. The Compaq 386, for instance, employs several interfaces, depending on what size (type) of hard disk you order. There is a new family of internal hard disks that contain both the disk and the controller on the same card (usually the controller is on a separate circuit board). These new cards are called *hard cards*. The best example of a hard card is the Plus Hardcard. This holds 20 MB and has an access time of a little over 40 ms. It is also very quiet and reputed to be highly reliable.

MEMORY OR STORAGE—MAKING YOUR CHOICE

The question in some people's minds might be how to decide which way to go in terms of hardware upgrades. Which is more important: more memory or more disk storage? There is ►

THE NEW URBAN BLUES

no quick answer to this question. In general, it is good to have a little bit more RAM memory and a faster hard disk.

Some people would say that it is also important to add a co-processor to the 8088 CPU chip so that everything runs a little faster. There are special boards, often called turbo boards that have a faster processor and more memory. The problem is that the quality of these boards can vary markedly and the co-processor may not be fully compatible with the system as a whole. It is always a good idea to call the manufacturer of a board to ask if it will work with your particular machine. Be prepared to tell him what other boards you have and what software you want to be supported.

INTEL ABOVE BOARD

A good choice, in my opinion, is the Intel Above Board for expanded memory. Intel developed the standard for expanded memory, along with Microsoft and Lotus. The Above Board comes in two flavors: with clock, parallel, and serial ports—called the Above Board PS; and the straight memory-only card, called the Above Board PC. The main difference, besides the additional ports and clock, is that the PS version can hold up to 1.5 MB of added memory and the PC card up to 2 MB. In theory, you can put several boards in your PC

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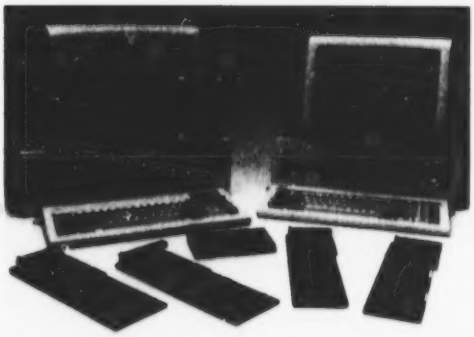

The Above Board PS/AT provides I/O ports plus conventional expanded, and extended memory for IBM PC ATs and compatibles. The Above Board with a full complement of memory retails for around $900.

The Overachiever from Computer Peripherals, provides up to 3 MB of either extended or expanded RAM. It is ideal for UNIX, XENIX, graphics, database retrieval, and the many pop-up menu programs.

The Above Board PS/AT and three other Above Board products are designed for use with the IBM PC ATs and compatibles.

to gain up to 7.5 MB of expanded memory. However, it is doubtful that your software could take advantage of that amount. The Above Board with a full complement of memory retails for around $900. It can be bought from mail order houses for as much as one-third off that price. An economical alternative is the Overachiever board from Computer Peripherals, with up to 3 MB. This is the board I use in XENIX and UNIX machines.

PRIAM ED-100 PC HARD DISK

For really fast access and high quality manufacture, the Priam 100 MB external hard disk cannot be beat. Priam, along with Control Data, is noted for its dedication to excellence in storage technology. The ED-100 (the ED is for External Disk) uses the RLL controller technology alluded to previously, allowing for high speed data transfer rates of 7.5 megabits per second. The usual transfer rate of the controller is only 5 megabits, so 7.5 is twice as fast. In addition, the Priam disk has an average access time of only 28 ms. This makes for a disk that is up to four times faster than the run-of-the-mill half height 20 MB unit that comes as an internal disk in many PC or XT clones (not for AT machines, for which there are other models).

The Priam unit comes with everything you need to install it in your PC. This is quite unusual since most hard disks have to be specially configured by a dealer with a compatible controller, cabinet, power supply, fan and even a ROM (Read Only Memory) chip that can format the disk properly. Priam ships the disk already in an external cabinet with its own power supply and fan. The controller has a special ROM installed that allows you to format this large disk in a way that MS DOS can address. It also includes software to overcome the limitation of 32 MB imposed by conventional MS DOS for any one disk drive. Such quality and thoroughness is not cheap, but you would not expect it to be. The unit retails for around $2500 but is well worth it.

CORE HC-150 AT HARD DISK

Since PC XT's are heavily discounted and even the AT's are being reduced in price, one alternative is to buy an AT clone for under $2,000. Victor Technology (the adding machine people) make a very solid Victor 286, manufactured under high quality control in Japan. (Japan produces the best quality products, followed by Korea, and then Taiwan as far as computer components are concerned.) Seagate 4051 and 4096 hard disks can be added to the Victor or even a 150 MB model from Core (the HC-150). Core also makes its own AT clone, the Atomizer. This is an ideal unit to act as a file server on a PC/XT/AT network. Its 10 megabit ►

transfer rate and 16 ms average access time also makes it efficient for CAD/CAM graphics design and for Microsoft's XENIX/UNIX operating system. The $4900 price tag on the HC-150 is well worth the extra investment since you get an unprecedented three-year warranty.

BANK SWITCHING—MORE FOR YOUR MONEY

In addition to beefing up your secondary (disk) storage with Seagate, Priam or Core drives, how would the cheaper expanded memory (primary storage) help? First, let's get some acronyms out of the way. The expanded memory standard developed by Lotus-Intel-Microsoft is often referred to as the LIM standard. However, the generic name for their efforts is simply called EMS or Expanded Memory Standard. There is also an EEMS version being promoted by some manufacturers, but since it includes the EMS, the difference is not really essential to our discussion.

One thing to remember is that the Intel Above Board has an unprecedented five-year warranty. One year is par for the course with many other companies and two years usually the maximum. Intel also has an 800 number hot line that answers questions about installation and configuration. Unlike many so-called hot lines, you are not made to wait days for someone to call you back. You usually are connected to a technician within a few minutes. The only other company that can match the hot line track record of Intel for promptness and thoroughness is AT&T. If you buy an AT&T 6300 computer, you automatically get 90 days free technical support. For an AT&T 6300 Plus, the free technical support is a full year!

So what is "bank switching"—some scheme to launder underworld money? No, it simply means that a program can leave a little bit of itself in the 640K "conventional" memory that MS DOS addresses and puts most of itself in expanded memory where it does not eat up the precious 640K that other programs are contending for. This means that the most active data has a toe-hold in the 640K conventional memory but spends the rest of its time slumming around the expanded memory neighborhood. It's kind of like hanging your hat at home but occasionally dropping into the bar around the corner for relaxation. The upshot to all of this expanded memory is that you can have a number of programs running together, sharing the conventional 640K memory. This amounts to what is sometimes called *multitasking*. What you get out of it is the equivalent of a multiuser system instead of a single-user system. Of course, the catch is that it is still only one user, but he is doing the work of several people all running different programs.

MULTITASKING SOFTWARE FROM SOFTLOGIC

SoftLogic is a company in Manchester, New Hampshire, that offers programs that help you really take advantage of expanded memory. Their programs also enable a hard disk to take over some of the functions of expanded memory, thereby making a fast higher-capacity hard disk even more advantageous. There are four programs from SoftLogic:

DoubleDOS – which allows you to divide your conventional 640K memory into two partitions.

Carousel – which will hold up to ten programs in expanded memory and swap them into conventional memory only when the user returns to them. The remaining two have nothing to do with expanded memory but can make your storage more efficient:

Cubit – which compresses files by as much as 50%, especially text files and then automatically decompresses them when they are viewed.

Disk Optimizer – which puts scattered pieces of files into a contiguous location, thereby increasing disk access speed.

For instance, you can have the system boot up into two memory partitions (DoubleDOS) that you can switch between at the touch of a single key. Then you can have the boot further invoke up to ten programs in one of the partitions (Carousel) and keep these programs more or less on the "back burner" until you call them back with a keystroke. With these multitasking utilities you can simultaneously edit ten chapters of a book, switching between them with the press of a key, leaving the others "suspended" exactly where you left off. Of course, you could also be running a spreadsheet, downloading data, doing color graphics, printing, and editing various documents all at the same time. Most of us by our very nature are multitasking. We sleep profoundly, but are aware of sounds in the night, filtering the familiar ones out and waking to strange ones. We drive a car, listen to the radio, and think about our grocery list at the same time. We get bored if we have to be limited to only one activity.

CONCURRENT PROCESSING

Multitasking is also called concurrent processing. Digital Research (the creators of the once famous CP/M operating system) has a "concurrent PC DOS" which is bundled with the Quadram EMS+ expanded memory board. This does essentially what the SoftLogic DoubleDOS and Carousel utilities do. This

combined effort of Digital Research and Quadram is characteristic of companies today who are fighting for a share of the market. Digital Research used to be the undisputed "king" of the software and operating system world. They have been severely eclipsed by Microsoft with its ubiquitous MS DOS operating system and the XENIX version of UNIX. Quadram is competing with the much more powerful and established Intel (chip makers to the world, who furnish the 8088, 8086, 80286, and the new 80386 CPU's for the IBM family).

CASHING IN ON A "CACHE"

Suppose you decide to get more memory and to splurge for a larger faster disk. You may even buy multitasking utilities. What else can you do? One thing is to use what is called *disk caching* to speed up retrieval of data. Disk caching, at the risk of oversimplifying, is figuring out which data you are accessing the most and keeping pointers to that data in a small segment of RAM memory. What happens is that you specify how large a cache you want to set aside. Then that amount of the 640K MS DOS memory is used for speeding up frequently accessed data. Of course you "lose" the amount of RAM assigned to the cache, but usually it is relatively small varying from 16K up to about 256K for large sets of data.

One program that does this well is Lightning, from the Personal Computer Software Group. Lightning allows you to assign the amount of "conventional" RAM that you want to act as a "cache." However, it goes one step further. It also takes advantage of the expanded memory of your Intel Above Board. What happens is this: once you tell Lightning how large a cache you want to create, it assigns a very small percentage to the 640K conventional MS DOS memory and gets the rest from the expanded memory. Isn't that smart? So, if you tell Lightning that you want a 256K cache, it only takes 16K from conventional memory and takes the remaining 240K from the expanded memory. This use of expanded memory means that the cache robs very little of precious RAM from your regular programs that depend on conventional memory.

Lightning will also tell you how many disk accesses it has monitored and by what percentage it has speeded up the whole process. Please note that disk caching enhances retrieval from the disk, but has little influence on writing data back to the disk. Your main concern, as a rule, is with viewing the data; that is, with reading a large file into your word processor for editing. Writing it back to disk is usually a final stroke you give the keyboard prior to your taking a break and getting a cup of coffee.

ELECTRONIC DISKS

There is another trick that expanded memory can conjure up for you. The Intel Above Board allows you to set up in the expanded memory the equivalent of a floppy disk, say, 720K in the 2 MB above the conventional MS DOS RAM. This is also true of the Overachiever from Computer Peripherals. The Overachiever can be configured for both a PC/XT and an AT 286 machine; whereas Intel has a separate series specifically for the AT family. This electronic disk, however, is not fettered by electro-mechanical limitations. Rather it is 100% high-speed RAM (ten times faster than even a hard disk). It is not all a bed of roses since you must first copy files from a hard disk to the electronic disk, called a RAM disk. This means that you must either copy them manually or else set up a "batch" program to do it for you. The crucial part is that you must then copy all new files from the RAM disk back to the hard disk before you turn off the computer. The RAM disk loses all its data when the power is turned off (on purpose or accidentally). This is a big caveat that could prove disastrous if ignored. In actual practice, however, it is not so difficult to copy files over to the RAM disk and then back to the hard disk.

Is the advantage really worth the trouble? You bet it is. Many word processors are rather slow in starting up, but once loaded into a RAM disk, they come up instantly. What I do is copy over all the word processor program files that are needed just to run the software. Then I invoke the RAM disk from a hard disk directory. If my files are on "c:" drive and the RAM disk on "d:", then my command would look like this:

While in the c:\wp\docs directory I simply type:

```
d:wp
```

This will run the word processor program from the RAM disk but save all the work to the hard disk on drive "c:."

RAM RESIDENT UTILITIES

Another advantage to the Intel Above Board and to the SoftLogic DoubleDOS and Carousel

Another advantage to the Intel Above Board and to the SoftLogic DoubleDOS and Carousel programs is that they offer an efficient way to handle things like spelling checkers and electronic notepads.

programs is that they offer an efficient way to handle things like spelling checkers and electronic notepads. Borland offers a whole series of utilities that do not have to be called up from a hard disk, but rather stay "resident" in RAM. One of these programs, the Lightning spelling checker and thesaurus (not to be confused with the disk cache utility mentioned earlier from the Personal Computer Support Group) can be called up even while you are in the middle of a full-blown word processing program. What happens is that the Borland Lightning is constantly on the watch for a misspelled or unknown word. It even scrutinizes what you type when not in a word processor.

For instance, you can check on the spelling of a word at the MS DOS prompt without being in any program at all. Borland Lightning beeps at you as you type an unknown word. You have the option of checking that word immediately, or waiting and checking the whole screen later on. The only problem with this super-quick spelling checker is that it takes up valuable MS DOS RAM, eating away at the 640K that all programs have to compete for.

To the rescue comes the RAM disk in the Above Board or the Overachiever expanded memory. Once loaded into the RAM disk, the spelling checker does its job but leaves the conventional 640K for other programs to use. There are a number of such utilities. Incidentally, the Borland checker will replace the incorrect word, with just a keystroke, from its rather large dictionary. Other checkers may just beep but not do the actual replacement.

SUPERKEY (BORLAND)

The "key" programs, of which there are several, allow you to enter complex stacked commands with just one keystroke. They also allow you to re-define the keyboard. You could program a key to enter your logon and even your search profile for online databank retrieval. This capability is similar to using "Function Keys" to send strings of characters to a remote computer. The only difference is that function keys are usually numbered and are therefore far from "mnemonic." That is, hitting the F3 key doesn't exactly ring a bell in your harried mind that this is for logging on a system. Whereas, pressing the ALT-L key might be easier to remember since the "L" could stand for "Logon."

MONITOR YOUR MONITOR

All of the enhancements mentioned above have to do with hardware and software. But what about the peopleware? No matter how sophisticated or powerful a system may be, if the people using it do not feel comfortable, then all the bells and whistles are no good at all. To make people feel "at one" with the computer, it has got to make relatively few demands on them. How is this "oneness" accomplished? The answer lies in what the user sees with his eyes before his very face. Vision is the most important of our senses. We are oriented toward being entertained visually. Witness the recent upsurge in the popularity of video cassettes. They are available everywhere, from the grocery store to the gas station.

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What the computer user sees is not the keyboard (unles he has never typed before), but rather the CRT or monitor. That monitor looks like a TV set to most people and their "conditioning" leads them to feel that something fun should come out of that tube. At the very least, if what flickers in front of users is not pleasing, their TV-orientation leads them to expect to be able to "change channels" with their remote control wand until they find something relaxing and worthwhile. So, that PC monitor had better be nice to our eyes and our psyches or else we will turn it off and go find something else more to our liking. This means that the more attractive the video display, the more likely we are to stare at it. If it is jittery and glaring, we will either quickly get a headache or pitch it in the trash.

What I recommend is that those contemplating purchasing a PC insist that they be given a good color monitor by Taxan or Amdek. These are the premier manufacturers of PC displays, used by professional programmers and systems developers. The Taxan 700 series and the Amdek 700 models are unsurpassed for clarity and ease of viewing. Specifically, I highly recommend that an EGA card by Paradise or STB or Tecmar or Tseng be bought and used to drive a Taxan 760 or an Amdek 722 EGA color monitor. Another possible approach would be to take advantage of the newer *multisync* monitors that can adjust themselves

to practically all the graphics controllers popular today. There are at least three products worth looking at: the NEC 1401, the Sony 1302, and the Taxan 770.

With these multisync monitors, a new breed of graphics card has also emerged, capable of emulating several established standards. NSI makes the SMART card, that can even make your multisync monitor act like a very high resolution Hercules monochrome display, in addition to providing the color of EGA. Tseng Labs has brought out their *EVA/480* that has much higher vertical resolution (480 lines instead of 350) and even has special software drivers for Microsoft Windows, the EGA paint program DR HALO, and for Lotus 1-2-3. Video-7 makes the Vega Deluxe that has 480 lines vertical resolution and not only has drivers for Microsoft Windows, but even furnishes a free copy of Windows!

Pizazz enables you to print up to 64 colors from almost any CGA or EGA monitor. Using Pizazz, you can also change the hues to others of your choice. Pizazz supports many printers.

DIFFERENT KINDS OF COLOR

The primary use of a computer for most non-scientific users is to write. The document being produced may be a letter to Aunt Emma or an accounting report to the Chief Executive Officer. The process of putting together a document or report is the same for all of us—very painful and full of revision after revision (not to mention typos). The high resolution monitor, whether it be in color (EGA) or monochrome (Hercules) makes this painful one-step-forward and two-steps-backward process infinitely more endurable. The average plain vanilla CRT, such as those by Televideo or even DEC, are really rather primitive compared to what can be done with a monitor.

What's the difference? A CRT has only one font or style of letters built in and usually has only one shade—either "grey" (black and white) or green or amber. After a while, the harsh contrast can harden anyone's vitreous humor. A monitor does not have any character set at all. It derives its display from a video controller or graphics card. This card sits inside the computer in one of the expansion slots. The graphics card can be either for monochrome or for color. In monochrome, the display color is determined by the monitor itself. A color monitor can switch its background from green to amber to grey to blue (for instance the Taxan 640) at the flick of a switch. For a palette of colors to be shown, a Color Graphics Adapter (CGA) is needed for medium resolution and an EGA for high resolution. The CGA usually can show only four colors at the same time in graphics mode and the EGA sixteen. The EGA mixes its sixteen colors from a palette of sixty-four. Both CGA and EGA can display bright colors in non-graphics mode, namely in what is called *text mode*. This is the mode used by word processing programs. The high resolution mode, until recently, could only show monochrome. Some programs, such as the amazing and economical Reflex database management system (DBMS) from Borland, can only address monochrome high resolution displays.

What is the difference between monochrome, CGA, and EGA? Monochrome takes the least amount of RAM to hold the display in memory. CGA takes a little bit more, but does so with circles that have "jaggies" (curves and angles that look like stair steps). EGA takes gobs of RAM for its display. As a matter-of-fact, the EGA "paint" programs that let you be your own Van Gogh should be run with no other programs competing for RAM memory. With word processing, the text mode (as opposed to graphics mode) does not take up much memory so the addition of colors is not expensive in terms of system overhead.

WORD PROCESSING WITH COLOR

Many programs that have been around a long while now make provision for color. However, the color may simply be having red for warning messages, blue for help screens, and green for entering text. A more helpful approach is that used by WordPerfect. When you install WordPerfect, you can assign colors to all the video attributes. This means that you could have blue for underlining, red for boldface, violet for underline and boldface combined, yellow for system messages, another color for the background and still a different one for the foreground. At first using all these colors may sound like Mardi Gras at the terminal, but you would be surprised how quickly your "mind set" appreciates symbolism of color-mapped attributes. After a few

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minutes, you unconsciously "feel" that blue is underlining and red is boldface without even stopping to think about it. A still further advantage is gained with EGA cards. The text is displayed in much larger letters (twice as big) and with much better formed characters (looks like typesetting).

After using the Paradise Autoswitch EGA card with the Taxan 760 EGA color monitor and WordPerfect 4.2, I find it positively painful to go back to my more prosaic UNIX vi editor and the Televideo 950 CRT. I even find it unpleasant to go back to a small non-EGA monitor after using the large Taxan 760 all day (the 760 is a 14 inch monitor which seems huge when only a few inches away from your face). Futhermore, with WordPerfect I can enter all my articles in double column format from the very start (many programs allow you to reformat in double columns for printing only). So what I type in automatically reformats itself exactly as if I were typesetting for the printer in newspaper style layout. WordPerfect has many other advantages, such as being able to switch between two documents instantly as well as automatic backup every five minutes (or however often you want).

TAILORING THE SYSTEM TO YOUR WHIM

Most of us would like to have a Nubian (as in ancient Rome—not as in modern Africa) slave following us around, fanning our brow and mixing us margaritas all day long. Well, I can't promise you a private "genie," but I can tell you how to make your PC do virtually the same thing. The secret lies in knowing what the AUTOEXEC.BAT boot-time file is all about and in using the Borland Superkey RAM resident utility.

AUTOEXEC.BAT sounds like something Babe Ruth might have used to hit a home run. The unexciting truth of the matter is that it is a list of things you want your PC to do as part of the booting up process. Superkey (Borland) allows you to do many things, one of which is to use only one keystroke to enter complicated stacked commands. These "canned" commands are called *macros* in the computer world. Superkey makes it easy to create a macro; you simply start a "recorder" going and then type in whatever series of commands you want to be brought up by the one keystroke.

Another utility from Borland, *Sidekick*, allows you to consult a calendar or start an electronic calculator on the screen in the middle of whatever you are doing or even create the equivalent of a little yellow "post-it" sticker. I can be breezing along in my word processor and suddenly get an inspiration. But instead of having to exit the word processor and open another file to store my brilliant idea, I simply hit one key and a menu pops up in color in the middle of my screen. From the menu I can choose a calendar, a calculator, a phone dialer, or a notepad. Sidekick will even pick a phone number off the screen at my cursor and dial it!

But back to AUTOEXEC.BAT. If I have a variety of programs and utilities, I can work out a master plan of exactly how I want my system to come up and then simply type the commands, in their proper order, into the AUTOEXEC.BAT file. The key phrase here is "in their proper order." Some things simply must come first before other actions can take place. For instance, if you are using the Intel Above Board and a RAM electronic disk, you must first bring these up in your CONFIG.SYS file. The CONFIG.SYS file is what sets up the preliminary configuration of things like memory and print buffers, the number of files that can be open at one time, and special device drivers, such as for a "mouse" pointer (you roll it around on the table to move the cursor rapidly).

After the basic parameters have been invoked by CONFIG.SYS, you probably then need to have AUTOEXEC.BAT start copying over all the files you want to take advantage of the high-speed electronic disk drive kept in a partition of expanded RAM. Then you can have your RAM resident utilities, such as those from Borland, be loaded into the RAM disk (once their programs have been copied over from the hard disk). Eventually you want AUTOEXEC.BAT to tell the "command processor" where to look for the commands you type in at the keyboard. This means setting up a "path" so that commands are first looked for, say, on a high-speed external hard disk, then on a slower internal disk, and finally in your subdirectory of utilities. The most frequently accessed place should come first in the path in order to speed everything up. You can have the boot process halt periodically with a "pause" command and ask if it is all right to continue. This gives you the chance to abort the process if things are going badly (for instance, you are running out of memory with all the new programs you just installed). With the Norton Utilities from the Peter Norton Company you can do such things as set the foreground and background colors and start a timer for how long the system is up. It is at the end of the AUTOEXEC.BAT file that you would invoke the operating system memory utilities, such as those from SoftLogic discussed above (DoubleDOS and Carousel).

I frequently change my AUTOEXEC.BAT file because I am loading different programs for testing and changing the size of parameters like the RAM disk to hold more memory resident utilities. You, however, would be less

likely to change it if your system is fairly stable (mine is absolutely peripatetic, if not actually pathetic – my PC gets nervous every time it sees me heading its way).

CHOOSING THE RIGHT SYSTEM FROM THE VERY FIRST

One way to avoid having to do too much adding of boards after you have bought your PC is to buy the one that best fits your needs from the very start. This means that you will have to analyze what you will be doing and try to determine just how much processing speed, storage, and memory you will need. Right off the bat, I strongly suggest you look at the AT&T 6300 Plus and the Compaq 386. Both these machines have lots of processing power, relatively fast disks (not as fast as the Priam or Core drives mentioned above), and an excellent reputation for reliability. The 6300 Plus uses the 80286 CPU chip and the Compaq the much more powerful 80386 processor, both from Intel. These are processors that are several times the power of the humble 8088 that comes in the IBM PC. They can drive a variety of hard disks which are at least twice as fast as the half-height internal units found in many PC's.

I use an AT&T 6300 – not the "Plus." This machine uses the Intel 8086-2 (the "2" means it runs at 8 MHz – almost twice the speed of the original PC). It also has its own built-in color video controller board. This color card is different from the IBM look-alikes. It is high resolution (640 by 400), in text mode but only handles the equivalent of the lower resolution CGA graphics color mode. It requires a special color monitor: either the AT&T, Amdek 725, or the Taxan 640. I have chosen the route of adding cards in the vacant slots of my AT&T 6300, mainly because I am used to doing that with CP/M machines which use what is known as the S-100 modular architecture (the Online, Inc. offices went from Apples to a CompuPro S-100 computer for their in-house processing and recently added IBM PC compatibles).

PORTABILITY OF ADD-ON COMPONENTS

In the last analysis, since people tend to buy new machines, one factor you may want to take into account is to what degree can you move cards and peripherals (those that sit outside the cabinet) from one machine to another? A brief answer is that almost everything you add to one PC that is not specifically for that unique machine should be movable to another PC. Of course some items are more transportable than others. Hard disks are a bit tricky to pull out and then re-install, particularly since their drive designations are probably already entered into many of your software programs.

There are exceptions. The Plus Hardcard from Plus Development has a capacity of 20 MB and is a self-contained card that could be easily moved from one system to another. As a matter-of-fact, one of its uses could be to act as backup between several machines. Likewise, you could easily move a Hayes 1200B internal modem – just unplug it from the phone line and stick it in another machine. Your communications software in the second machine needs to know what you have put there for its use and how it is configured, but if the software is set up identical to that in the first machine, then everything goes much smoother. The Intel Above Board can be re-installed in another machine, assuming that its memory is to be configured identical to that of the first machine (it can be different, which means that the re-installation will take a little more effort on your part).

Graphics cards can easily be moved. As a matter-of-fact, I move them at least once a week as I test out different ones. The only minor inconvenience is being sure that the utility software that comes with many of the EGA cards is also installed on the new machine. Obviously a monitor does not care which machine it is cabled to. You do have to be careful when you move a monitor that the video controller card it is attached to is the correct one for it. With a little bit of planning and luck you could move practically everything that is not "proprietary" to a specific machine over to a different PC with a minimum of frustration.

LAST MINUTE OBSERVATIONS

Your best bet against the PC "blahs" is to drive the dealer crazy exploring all the alternative components to those he normally throws in a PC box. In order to bug him effectively, you should arm yourself with an armload of manufacturers' ads from *Byte*, *InfoWorld*, and *PC Magazine*. Before you substitute an add-on for what the dealer recommends, don't forget to call the manufacturer and check out just how compatible his product is with the rest of your hardware and with the software you intend to use. Don't assume, for example, that all EGA cards run with all software. This is especially true of sophisticated "windows" type programs that use a lot of "overlayed" program modules. Caution is especially warranted with the freehand artists' software called "paint" programs (PC Paint Plus, PC Paintbrush, and EGA Paint to name several of the better known ones).

PARTS BIN LOOK-ALIKES

If you bought an Edsel and think it is a great car, you might want to consider buying a PC

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that a smaller firm—not a major manufacturer—has put together. Come to think of it, the Edsel was a soundly built car. It had an image problem.

There are some very good machines, which also have an image problem. To be specific, very few people have ever heard of them, except for those of us who practically memorize every ad in computer magazines.

This parts bin approach usually means that some technically sophisticated mail order house has ordered a bunch of processor boards (called "mother" boards) from one source, a cabinet from somewhere else, and disk drives from yet a third source and put them all together. The result is a system that is at least half the price of an AT&T 6300 Plus or a Compaq 386. The thing to look for is a 30 day no-questions-asked period in which you can return the unit. A one year warranty is also essential.

PC Limited has won rave reviews for the quality of their mail order systems. The PC XT look-alikes are under $1000 and the AT twins start at under $2000. They even have a unit that runs at 16MHz (the PC has a 4.77 MHz CPU) for just under $3000. Most such firms also import EGA card and Hayes internal modem look-alikes at prices far below those of the brand-name products. The hard disks offered are pretty much the same as those by larger firms but have the advantage of not being restricted to only one model. For instance, the best known drive manufacturer is Seagate, but there are others just as good and often better. One question to ask over the phone is how many layers is the CPU ("mother") board. The better quality ones have four layers.

Another technical spec worth determining is whether the memory is capable of "0 wait state," as well as the more common "1 wait state." The "0" means that things move faster, but some add-in cards may not be able to handle speeds above 8MHz with 1 wait state. Finally, be careful that the look-alike isn't a slow klutzy run-of-the-mill PC that has merely had an "accelerator" board added to it. It is best to have a processor board that has only one CPU whose speed can be switched, preferably from the keyboard. Some accelerator boards replace the 8088 CPU or put another chip in the empty 8087 math processor socket. Others may substitute a chip for the clock circuitry. In many cases, electronic probes are plugged into already existing circuits to coordinate speeds with system activity. Unless someone you trust has an accelerator board that they enthusiastically recommend, it is probably best to consider their much-advertised benefits as not completely substantiated.

THE DO-IT-YOURSELF KIT

In the "early" days of microcomputing, everybody had to assemble the components, solder them together, and then pray fervently while turning the switch on. Companies such as Heathkit (believe it or not, Radio Shack was a late comer) made their reputation with these kits. There is now a new breed of kits. The ones I read about are aimed at the AT market. The savings by doing it yourself can be considerable, but the frustration may not be worth the difference, especially when it comes to warranties and technical support.

My recommendation is that you stay away from these kits. If you feel adventuresome, you may want to try your abilities on relatively straightforward things such as installing a hard disk or upgrading the memory. Your time is probably better spent with software. Making various software programs work together can tax all your energies and patience and is far more rewarding since what you are doing is tailoring a system to your own personal needs.

REMEMBER THE HOT LINE

In the last analysis, unless you are a businessman looking to buy a number of computers for your company, it is doubtful whether your dealer will be able to justify spending as much time with you as you would like. Fortunately, most firms in the "add-on" market realize that making technical advice available before and after the sale is in their own enlightened self-interest. Take advantage of whatever hot lines are mentioned in ads. Call up sales and technical personnel and get them to help you determine whether their product will meet your needs. You can even call software houses and ask their recommendations on what hardware they have found enhances the functioning of their program. Many times they keep lists of compatible hardware and are quite willing to send you technical bulletins. After all, if you buy the right hardware it makes their program work and look that much better.

The whole idea of upgrading your PC is to make you work more efficiently and to feel more confident about your machine. I personally think that the products discussed in this article will "make your day" for years to come—that is until the next exciting crop of electronic gizmos comes around.

Good luck!

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MAKING A HARD DISK EASY

by Brian Phillips
Computer Specialist
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Editor's Note: In the February 9, 1987 issue of INFO WORLD (page 3), Jeff Angus writes that a system operator on a Los Angeles bulletin board found a bogus version of PC-Write that when invoked, "destroys the file allocation table of a user's hard disk and initiates a low-level format, destroying the hard disk's data." This destructive version masquerades as a newer release of Version 2.71 and is 98,274 bytes long, as opposed to the real Version 2.71 which is 98,644 bytes. (The real Version 2.7 is 98,242 bytes long.) According to the notice in INFO WORLD, *the version posted on CompuServe is the real version. Quicksoft, PC-Write's developer has posted a $2,500 reward for the first person who identifies the creator of the bogus program and a $5,000 reward for a conviction. If you have information about this bogus program, call Quicksoft at 206/282-0452.*

—HG

With the drop in disk storage costs and the users' insatiable appetite for more storage capacity, the use of hard disks in libraries is becoming as common as the microcomputer itself. The obvious benefits of hard disks are: relatively unlimited storage capabilities; larger databases; faster disk access; and, the elimination of piles of floppy disks. The problem associated with hard disk use is managing the overwhelming number of files that quickly accumulate. The storage of hundreds, and even thousands, of files on a hard disk requires the creation of a labyrinth of subdirectories to separate the files into more manageable units. To navigate through this maze is a host of commands which complicate DOS beyond the capability and interest of most novice users. Before a file can be retrieved on a hard disk, it must be prefaced with a cryptic assortment of backslashes and subdirectory names. Remembering the layout of your subdirectories, the location of a particular file, and the path to the file, can be frustrating for even an accomplished computer user. The way to spare your staff the complexities of DOS, and to prevent them from getting lost in the vast expanse of disk space, is to write a front end menu.

WRITING A FRONT END MENU

A front end menu can help you create a completely menu-driven turnkey system to make hard disk use considerably simpler than a floppy disk-based system. The front end menu appears immediately after you turn the machine on and enter the date and time. The menu presents the user with a list of choices which are typically the applications programs and some common DOS utilities. Entering the number that appears next to your desired application, will load the program and present its opening menu. When you exit the program, the front end menu reappears, allowing you to choose another application. Anyone with an IBM PC, or compatible, and DOS version 2.0, or later, can write a front end menu. Creating an easy to use system is not a complicated process if you are familiar with DOS. If you do not feel comfortable venturing beyond the DIR, COPY, and FORMAT commands, the creation of a menu-driven system is best left to the systems librarian, the campus ADP department, or a consultant.

The Batch Files

By writing a series of DOS batch files, you can produce menus tailored to your specific

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SOFT

. . . The Quickest Way To Find The Microcomputer Software That Precisely Meets Your Needs

File SOFT is a database of microcomputer software specifications and descriptions. Using it, you can enter a wide variety of software requirements – such as Type of Application . . . Cost Range . . . Hardware Requirements . . . Operating System . . . and Producer Name.

Example: You want to find the names and specifications for "all integrated programs that combine word processing, creation and management of a database, plus spreadsheet analysis" and runs on a minimum of 256K on an IBM or IBM compatible micro. You also want the ratings (on a scale of Poor to Excellent) that various reviewers have given the programs that are found. Such a search would take 1 minute, 40 seconds and yield four hits that exactly meet the requirements: "INTUIT," "ELECTRIC DESK," "SMART SOFTWARE SYSTEM," AND "AURA."

File SOFT is mounted on BRS and contains records for over 5,000 micro software packages. The database is particularly popular with programmers, themselves, because of the wealth of data in the records and the many access points.

To use File SOFT, simply log on to BRS and type in SOFT as the file name. If you do not have a BRS password, write or call BRS, 1200 Route 7, Latham, NY, 12101, telephone 800-833-4707, in NY 800-553-5566.

applications and needs. A batch file is an ASCII text file of DOS commands and always contains the filename extension .BAT. To execute a batch file, you need only type the file's name without the extension. A batch file named 1.BAT can be executed by pressing the number 1 and then the (ENTER) key. An AUTOEXEC.BAT file is a special purpose batch file that automatically executes when the system is turned on or rebooted. Batch files can be written by using the COPY CON command, the DOS line editor program EDLIN.COM, or a word processing program that produces ASCII files. The easiest option is to use a word processing program that produces ASCII files. Most word processing programs will output files in ASCII format. If your word processing program does not, PC-Write and Textra are two easy to use word processing programs that can create ASCII files. (PC-Write is available through computer users groups and bulletin boards for about $10 or from Quicksoft, 219 First N. 224, Seattle, WA 98109; 206/282-0452, $89.00;Textra can be purchased from Ann Arbor Software, 345 South Division, Ann Arbor, MI 48104; 313/769-9088, $19.95-$39.95.)

To create the following front end menu, you first load your word processing program on your PC. With the word processing program, create a file with the filename AUTOEXEC.BAT. Type the commands on separate lines as shown in boldface below.

(AUTOEXEC.BAT)

```
ECHO OFF
DATE
TIME
MENU
```

Save this file to disk. If your word processing program has a switch to save the file in ASCII format, then invoke the switch before saving the file. Each line in the batch file executes a DOS command, another batch file, or an applications program. The **ECHO OFF** command tells DOS not to display the batch file commands on the screen. The **DATE** and **TIME** commands prompt the user to enter the current date and time. The **MENU** command calls up the MENU.BAT file which is the next batch file you should create.

(MENU.BAT)

```
ECHO OFF
PROMPT Enter your choice:
CLS
ECHO    Welcome to the Anywhere Public Library Computer System
ECHO    .....
```

```
ECHO                    Your choices are:
ECHO  ..................................................
ECHO                    1  Word processing
ECHO                    2  Database
ECHO                    3  Backup Files to Diskettes
ECHO                    4  Format Diskettes
ECHO  ..................................................
ECHO  Type in the number you want and hit (ENTER).
```

The **PROMPT** command changes the prompt from displaying the current disk drive (A>, B>, C>) to **Enter your choice:**. The prompt will appear in the menu as the last line of the display immediately followed by the cursor. The **CLS** command clears the screen so that only the menu is displayed. The **ECHO** command displays the text that follows it on the screen. (The text after the **ECHO** command can be customized to display your library's name and different applications.) Save this file to disk under the filename MENU.BAT.

A batch file for each of the menu choices must be created with the filenames 1.BAT, 2.BAT, 3.BAT, and 4.BAT. Create the following batch files in the same manner as the AUTOEXEC.BAT and MENU.BAT files.

(1.BAT)

```
ECHO OFF
CD \ WP
CLS
ECHO                    Program loading . . .
TEXTRA (Substitute your program's executable filename)
CD \
MENU
```

This batch file uses the **CD** (change directory) command to move from the ROOT directory to the WP subdirectory (more on subdirectories later). It then calls up the word processing program (in this case Textra), and displays **Program loading** on the screen. To call up your particular word processing program, substitute your program's executable filename (e.g. **WS** for WordStar, **WP** for MultiMate) instead of **TEXTRA**. After the user exits the program, the batch file changes the subdirectory back to the root directory (represented by a backward slash (\ ) and returns the user to the main menu.

The 2.BAT file is written in the same manner.

(2.BAT)

```
ECHO OFF
CD \ DB
CLS
ECHO                    Program loading . . .
Nutshell (Substitute your program's executable filename)
CD \
MENU
```

The 3.BAT batch file provides a menu-driven approach to backing up the hard disk to floppy disks and is written as follows:

(3.BAT)

```
ECHO OFF
CLS
ECHO  Have at least six formatted diskettes ready for use.
ECHO  (If you do not have the diskettes formatted exit this
ECHO  menu now by pressing CTRL-BREAK, terminate batch job,
ECHO  then type MENU (ENTER) to return to the main menu
ECHO  to format the diskettes.)
ECHO  ..................................................
ECHO  Label the diskettes with the current date and number
ECHO  them consecutively.
ECHO  ..................................................
ECHO  Place the first backup diskette (no. 1) in Drive A and
PAUSE
BACKUP  C: \ A: /S
MENU
```

The CTRL-BREAK key sequence stops the execution of a batch file and the message **Terminate batch job (Y/N)?** is displayed. The **PAUSE** command halts the execution of a batch file and generates the message **Strike any key when ready . . .** The **BACKUP** command with these parameters will backup all the files on the hard disk and write them to the A: drive. These parameters can be modified to backup only specific files such as a database, or only files that have been modified since the last backup. The message to have **at least six formatted diskettes ready** is an arbitrary number used for this example. You can determine the number of diskettes needed to backup the files on your system by using the CHKDSK command. CHKDSK will show you the total number of bytes on your hard disk and how many bytes are available for use. Subtracting the number of bytes available from the total will give you the size of all your files. Then divide the number of bytes used by your files by 362,000 (the number of bytes on a diskette). This will give you the number of diskettes needed. (See your DOS manual for more information on the CHKDSK and BACKUP commands. The BACKUP parameters for MS DOS are different than those used by PC DOS!) The last batch file in this example is 4.BAT. It should be written as follows:

(4.BAT)

```
ECHO OFF
CLS
ECHO  (CAUTION – formatting destroys all data on the diskette.
ECHO  Be sure the diskette to be formatted is blank and
ECHO  previously unused.)
```

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```
ECHO .....
ECHO To cancel this operation pres CTRL-BREAK, terminate batch
ECHO job, and type MENU (ENTER) to return to the main menu.
ECHO .....
ECHO Place diskette in Drive A and
PAUSE
FORMAT A:
MENU
```

All the commands in 4.BAT have been used in the previous batch files except FORMAT which should be familiar to you. This menu choice is not only a convenient way for novice users to format diskettes, it is good insurance that a user does not inadvertently format the hard disk and erase all the data on it. If this prospect gives you sleepless nights, you can even rename the FORMAT command (e.g. FORMATX.COM). Just be sure to use the new filename in the 4.BAT batch file.

FIGURE 1

The main menu that you have completed will appear to the users as shown below.

```
Welcome to the Anywhere Public Library Computer System

.....

Your choices are:

.....

    1 Word processing
    2 Database
    3 Backup Files to Diskettes
    4 Format Diskettes

.....

Type in the number you want and hit (ENTER).

Enter your choice:
```

The Subdirectories

Once the batch files are written, you must create the appropriate subdirectories on your hard disk. If your hard disk has not been formatted, read the DOS manual to do so. Make sure the system switch is used (FORMAT C:/S) to put the system on the hard disk. Copy all the files on your DOS diskette to drive C:. Next copy all the batch files you have created to drive C: These programs will reside in the root directory. The batch files and the DOS files must reside together in the root directory to execute the menus in this example.

Now you must create subdirectories on the hard disk where your word processing and database programs and files will reside. Make sure that drive C: is the default drive. (Your prompt should be C>.) Using the MD (make directory) command, type **MD WP** (ENTER) and **MD DB** (ENTER). The WP subdirectory is where your word processing program and files will reside. The DB subdirectory is where your database program and files will reside. Copy your word processing program to the WP subdirectory from the A: drive with the following command: **COPY A:*.* C: WP**. Copy your database program in the same manner except substitute DB for the subdirectory name.

There are many alternative methods that can be used to achieve the same results when writing batch files. For example, instead of writing the menu's text in the batch file with the ECHO command, the menus can be created as a separate ASCII text file. Using this method, the TYPE command, followed by the filename, is placed in the batch file to display the menu. There are also alternative methods for creating subdirectories on the hard disk. For example, a separate subdirectory can be made to store all DOS files and a PATH command can be used in the batch file to route the DOS command to the DOS subdirectory. The menu system presented here is intended as an introduction to DOS batch files and it was kept as simple as possible.

CONCLUSION

The combinations of batch files that can be created are limited only by the imagination and ingenuity of the person creating them. You can write context sensitive help screens for the system users by writing batch files, naming them HELP.BAT, and placing them in various application specific subdirectories. You can have the current date and time display in all your menus. You can load and run BASIC programs from a batch file giving you the capability to control screen colors (if you have a color monitor) and to dress up your menus with flashy graphics (if your monitor has graphics capability). You can use replaceable parameters to allow the user to specify different variables (e.g. disk drives, filenames) each time a batch file is executed. You can use a conditional command to have the batch file check if certain conditions exist before executing. The easier the menu system is for the user to use, the more difficult it is for the batch-file writer to create. Creating a menu-driven hard disk system will mean more work for you. However, the end result is less work and less frustration for your staff.

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Note: Neither Online, Inc. nor the author are responsible for loss of data as a result of using any published program. It is the responsibility of the end-user to verify the appropriateness of this and other "freeware" programs.

DOWNLOADING AND POST-PROCESSING ONLINE NUMERIC DATA

by Philip M. Clark
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The data retrieved from numeric databases differs from that retrieved from text databases in one important respect. That is, it is meant to be analyzed mathematically, statistically, or graphically.[1] The end-user of the search may want to use one of the popular spreadsheet programs such as Lotus 1-2-3 to calculate averages and standard deviations, or load the data into a database manager such as dBASE in order to sort and summarize it. Or, the intended product of the search may be a graph that visually summarizes the data.

The problem that faces the intermediary searcher in these situations is the downloading of such data in a form that can be easily transferred to spreadsheets programs, database managers, or graphics programs. The problem is considerably easier to handle currently than it was in the past. As will be discussed, DIALOG now has a feature within its REPORT function that automatically reformats data to a structure usable by most of these programs. Specially designed gateway software such as Dow-Jones' Spreadsheet Link works in conjunction with a spreadsheet program to automatically sign-on to the retrieval service, conduct the search, and download the data for direct use in a spreadsheet. Online databases that are not supported by DIALOG's REPORT function, such as **CENDATA**, may have an inherent structure that can be converted to a format that is readable by one of these programs, aided by a bit of word processing magic.

END-USER NEEDS

Data that will be subjected to analysis by the end-user are enormously varied, and may include everything from a comparison of the assets and liabilities of a group of companies in an industry grouping, to an analysis of demographic trends and descriptions across several countries. The products of the search can be a simple printout of the retrieved data, or a formatted report produced either online or through the use of a word processor.

However, it is data that will be used for fur-

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ther analysis that is the focus of this article. How that data will be analyzed is obviously the responsibility of the end-user, not the searcher. But the searcher can provide a data file that is conveniently structured so that it can be imported into a spreadsheet or database manager.

SOFTWARE FOR DATA ANALYSIS

Spreadsheet programs are the most common data analysis tool used with microcomputers. The best selling program is Lotus 1-2-3 and has become the "standard" for IBM-PC users. In order to stay competitive, most other programs have incorporated an ability to read Lotus 1-2-3 files in some fashion. This is accomplished by a conversion utility program or the ability to read Lotus files directly. SuperCalc 4, for example, can load Lotus files as simply as it loads its own files (and can write to the Lotus format directly as well). MultiPlan (Version 2), another significant player in this game, can translate data directly from Lotus as well.

The point is that if a search can be downloaded into a format Lotus can read, that same format can be read by most other spreadsheet programs as well.

The point is that if a search can be downloaded into a format Lotus can read, that same format can be read by most other spreadsheet programs as well.

Database management software was originally designed to also do complex data analysis. Early examples of such software illustrated their capabilities with examples of complex accounting systems. However, database managers are especially good at re-arranging data: sorting it into categories; picking and choosing data elements that meet certain criteria. Librarians see such programs as essential aids in re-arranging bibliographic data (or so it would appear to this observer).

Ashton-Tate's dBASE series is the most popular of the relational database managers. PFS:File is also enormously successful in the more easily used file manager category. Because of dBASE's capability of reading and writing both fixed length and delimited files, it has long been a popular translating program. That is, data could be read from, for example, a delimited WordStar file directly into dBASE, and then transferred to a spreadsheet program from dBASE.

Many spreadsheet programs have the capability of reading dBASE files directly, and, other competing products in the database management field such as R:BASE are the same.

A recently emerging type of program sometimes called an "analytical database" tries to combine the sophisticated mathematical functions of the spreadsheet program with the data handling capabilities of database managers. In fact, the latest versions of dBASE and R:BASE are stressing their computational sophistication and might also fall into this category. Borland's Reflex (and Reflex for the Mac), is a relatively inexpensive example of this type of software. Paradox from Ansa and Javelin are others.

All can share data with the major "standards," Lotus and dBASE and thus with other programs that read data from these programs.

In point of fact, if data can be placed into one of three types of data format discussed below, virtually any program can read that data. Statistical packages such as SPSS and SAS can read it, word processors can read it, and graphics programs can read it.

THE DATA STRUCTURE NEEDED

Numeric data that will be analyzed or post-processed must be arranged in record and field format. This typically means that a special character must be placed in the file that separates one record from another, and one field from another. Records are normally separated by a carriage return or "end of line" character. In fact, it is quite usual to see references to records as being contained on one line or, when talking about spreadsheet programs, one row.

Each record is composed of one or more fields. The manner in which the beginning and end of each field is defined is the most important aspect of defining a data structure. Two approaches are most conventional: the fixed length field, and the delimited field.

Fixed Length Fields: Fixed length fields are an artifact of early data processing concepts when the Holerith or 80-column "IBM Card" was the medium of data entry and storage. Each field began and ended at a predefined position on the card, these positions were referred to as the column number. Column numbering began with position 1 at the beginning of the card, and extended for as many columns as the machinery was capable of reading.

We continue this protocol today with fixed length fields being defined as starting and ending at certain positions within a record. For example, a three-field record composed of com-

pany name, total assets and total liabilities might be structured so that company name began in column 1 and ended in column 31 (thus containing 30 characters of data), total assets began in column 32 and extended through column 50, and total liabilities began in column 51 and went to column 70.

A slightly different way of indicating the beginning and ending boundaries of a field is to give the length in characters of a field. This is illustrated by Ashton-Tate's dBASE series where one names a field, specifies its length, and notes the type of data that will be contained in it (numeric or character). The software program then computes the beginning and ending points from the beginning of the record. Typically, there is a limit on both the length of a record, and correspondingly the length of the fields within that record.

Fixed length fields may also be referred to as Structured Data Format (SDF), a term popularized by dBASE. Whatever the term, the essential format is locational, with set beginning and ending points for each field.

Delimited Fields: Delimited files became appropriate when tape became the medium of storage. In order to save space on the tapes, the beginning and end of a field was identified by a delimiter or special character. Thus everything between the delimiters was considered to be data for that field. A more widely known term among librarians for this type of data structure is "variable length" fields. In microcomputer jargon the two terms "delimited" and "comma separated" fields have become commonplace.

A more widely known term among librarians for this type of data structure is "variable length" fields. In microcomputer jargon the two terms "delimited" and "comma separated" fields have become commonplace.

In a delimited file, a special character separates one field from the next. The most used type of delimited file is the comma-separated file where the special character separating the fields is the comma. It is also conventional to differentiate between text and numbers by enclosing text in double quote marks. Enclosing text in double quotes also has the advantage of allowing one to include a legitimate comma in a field and thus not trigger off an indication that this is a new field.

Figure 1 illustrates a typical fixed length file with nine records that were downloaded from DIALOG. The line of numbers across the top indicate the column numbers so that one can see where the fields begin and end. (Note, however, that this line was added offline and is not usually provided in the online search environment.) For example, the field CITY begins in column 33, TTL CURR ASSETS in column 55, and so on.

Figure 2 is the same file, but configured in a delimited or comma separated format. Notice the double quotes enclosing textual material. The commas define the end of each field. If there is no data in a field we must still include a comma. Otherwise, a program would incorrectly insert data into the wrong position.

Date Interchange Format (DIF): A third type of data format is the DIF file or Data Interchange Format. This is a format developed by the producers of the original VisiCalc spreadsheet program, and allowed data to be transferred to other spreadsheet programs. While some spreadsheet programs cannot read a Lotus file directly, they usually can read a DIF file thus allowing data sharing between programs. Figure 3 is a short example of such a DIF file.

One must make certain that the file to be used is a clean one. That means that fields that contain numeric data must NOT contain anything except the digits 0 through 9. If there are dollar signs, percent signs or commas in a numeric field, most programs will detect an error and not accept the data or will assume, incorrectly, that you intend this to be a text field. Also, it is conventional in many reports to surround negative numbers with parentheses, but these parentheses will cause errors as well. Instead, a minus sign can be used to indicate negative numbers without causing an error.

Here are a few examples of clean and "dirty" numbers:

12345	(clean)
$123,456	(dirty)
123,456	(dirty)
$456	(dirty)
45%	(dirty)
-123456	(clean)

As is discussed later, the ability to retrieve a "clean" number from an online search can be very difficult, but it is absolutely necessary to have such clean numbers if the numeric data is to be analyzed with any of the appropriate software programs. If the intended use of a downloaded file is for numerical analysis purposes, be very careful to establish that such numerical fields are "clean."

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TECHNIQUES FOR ACHIEVING THE NEEDED POST-PROCESSING FORMAT

There are several techniques that can be used to create a file that has the data format required by analysis programs. The first technique is to download directly in the required format. DIALOG's REPORT generator is now capable of downloading searches in the three formats discussed above. The second way is to use a gateway program such as Dow-Jones' Spreadsheet Link that places retrieved data in the proper locations in a spreadsheet. The third technique is the most difficult, and involves cleaning-up a downloaded search using a word processing or utility program.

Direct Downloading: The simplest way to download numeric data for analysis is to do it directly with the REPORT command in DIALOG.[2] This is a new, and sure to be much appreciated, feature. The three post-processing formats discussed above are supported by REPORT by merely adding either **FIXED** or **DELIM** or **DIF** to the end of the REPORT command. For example, the instruction

```
REPORT 2/CO,CY,CA,TL/1-10 FIXED
```

would create a fixed length file for set 2 of four fields (company name, city, current assets, and total liabilities) for the first ten records.

Nothing could be simpler. Numeric data are downloaded "clean" and thus stripped of commas, $, and % signs, and minuses are inserted for negative numbers. A word processor or line editor is then used to erase any search statements from the file. If a DIF format is selected, the file extension will probably have to be changed to **.DIF**, or several programs require that a delimited file be renamed with a **.PRN** extension, before moving the file to the data analysis software.

WHICH FORMAT FOR YOUR PROGRAM?

The *CHRONOLOG* article cited above has recommended formats for eight popular software programs. In general, the article recommends a delimited format for Lotus, PFS:File, Jazz, and Double Helix. The DIF format is recommended for dBASE III and MultiPlan. SuperCalc 4, Reflex, and most other programs will accept either delimited or DIF formats.

Selecting the DIF format will result in the easiest data transfer, because this format is usually selectable from a menu in the software program. Lotus, for example, has a **Translate Utility** program in which you merely select the **DIF to WKS** option, name the incoming, downloaded file with a **.DIF** extension, and conversion takes place immediately.

Be warned that downloading in the DIF format may take longer than downloading in the other two formats. Compare Figure 3 with Figures 1 and 2 and notice how many lines there are in each. Each line takes a certain amount of time to be downloaded thus increasing the cost for downloads using the DIF option. For short downloads on the less expensive databases this will not be a great problem. However, for lengthy downloads or when using expensive databases, it will be more cost-effective to choose another post-processing option.

The delimited option is recommended if the cost of selecting the DIF option is overwhelming. Your program may have a menu selection for translating a delimited file. For example, in SuperCalc 4 one selects the **CSV** (Comma Separated Value) option and the file is immediately loaded.

If you cannot select a delimited option from a menu, you may have to issue a command such as in dBASE's **APPEND** and **DELIMITED WITH** instructions. You may also be required to specify the fields, their lengths, and type of data before importing the file. Most database managers require prior definition of these file attributes.

It must be noted that Lotus 1-2-3, Version 1A[3] has problems importing a delimited file that contains blank fields. Version 1A will ignore these blank fields and slide all the data to the left. Thus, data will be transferred to the WRONG field! So Lotus users be warned. If a downloaded report contains blank fields, (and in some databases, certain fields are quite likely to be blank) be VERY careful in using the delimited option in DIALOG Report. In fact, check to see how your program handles blank fields by downloading a search that has known blank numeric fields and inspect the results.

Here is the last line in Figure 2.

```
"ALPHEUS TECHNOLOGY INC", "PARSIPPANY",,92,2010119,2,,
```

Notice that two commas follow the city name. Were there a number between the commas it would indicate the total current assets of this firm. Blank fields such as this can be used in Lotus Version 1A only if a set of double quote marks are inserted. You can use the Find and Replace feature of a word processor to search for this pattern and replace it with a comma, two double quotes, and another comma. The new record would then look like this.

```
"ALPHEUS TECHNOLOGY INC", "PARSIPPANY", " ", 92,2010119,2," ",
```

When this is done on the entire file, Lotus will correctly read the file when you use the **File, Import, Numbers** sequence. The cells identified as blank will be label cells but can be changed to value cells later.[4]

The fixed length format is generally not a

recommended option for spreadsheet file transfer. However, it can be used effectively when a program has an option to import or translate a structured data format file (SDF). dBASE has this option as do many other database management programs. You may have to count the number of characters in each field, and enter these definitions along with field names into the translate specifications of your program. This can be done, but involves the most work of the three post-processing options.

The latest versions of most software contain built-in or selectable data translation options as part of their menu selections. Look for the DIF and delimited options first. If the options are not specified as part of the menu selections, scour the manual for references to translating or data importing.

I.P. SHARP DATABASES

I.P. Sharp specializes in numeric databases. It is possible to do sophisticated analysis with mainframe resident routines or download to specialized software that they produce or support.

Of interest to the topic of this article is the ability of users of the I.P. Sharp databases to download to either ASCII format or DIF format. The DIF format allows the user the same options for use as was described in the discussion of the DIALOG REPORT option. The ASCII format (or .PRN option) is the same as a straight download from DIALOG with all its possible problems. These problems are associated with getting a "clean" number (see above).

GATEWAY SOFTWARE

I.P. Sharp has a software package under development that will ease the transfer of data into programs such as Lotus. It will be a type of gateway to the Sharp databases with sign-on protocols, selection menus, and the ability to convert the downloaded data to standard software file structures such as the .WKS format of Lotus 1-2-3. There is an advantage to a gateway program that does the conversion into the desired software format. Data transmission speed and error checking are maintained at a high level while online. The slower conversion to a specific software format is then done offline on the user's PC.

Dow-Jones' Spreadsheet Link is a currently available gateway program that dials Dow Jones News/Retrieval, conducts a predefined search, and downloads the data in a format that is immediately accessible by either Lotus, MultiPlan, or VisiCalc. First, one sets up a spreadsheet with the various data item identifiers located in the columns of the first row of the spreadsheet. In the first column one lists the various stock symbols for which one wants to retrieve data on the identifiers listed in the various columns. After saving this spreadsheet, a retrieval program is called up which does the dialing and downloading. After logoff, you can call up the spreadsheet which now contains the retrieved data. You can insert formulas to perform calculations on the data you have retrieved, and massage the data to your hearts content.

Spreadsheet Link is easy to use, speeds up searching greatly, and downloads the data directly into a spreadsheet. However, you must own one of the three supported spreadsheet programs, or have a program that is a direct clone of one of them. Unfortunately, it does not support database management software such as dBASE.

DATABASES NOT SUPPORTING DIALOG'S REPORT CAPABILITY

Many of DIALOG's databases are not supported by the REPORT option because they are textual databases. Yet certain of these may contain numeric data that would be useful for analysis. A good example is the CENDATA database that contains reports or tables from the census data.

Converting a table such as the one illustrated in Figure 4 calls for a bit of manipulation with a word processing program. Depending on the construction of the table, a great deal of work might have to be done in order to "clean" the file, and convert it to either fixed length or delimited format.

Tables that have a column and row structure are the easiest to convert. In these files, all the data in a given column is the same field. If the data in a column are not of the same field, the following tips are not likely to work.

A word processor's Find and Replace functions are used to locate commas, dollar signs, percent marks, etc. These are replaced with "nothing;" in effect, they are erased. A file may also contain other symbols that would cause problems if they were transferred to an analysis program. In Figure 4, the letter X is used in the ranking columns to indicate that a ranking is not appropriate. These can be replaced with a number such as a zero or 99 to warn the user that this is an inappropriate number.

If there is textual material in the table that you wish to retain, such as the abbreviations of the states in Figure 4, it should be enclosed in double quote marks. There are several ways to go about this task depending on the capabilities of your word processor. Most word processors are capable of searching for "wild cards," such as any two letters followed by two periods. This pattern can then be replaced with

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a double quote, the two letters, two periods, another double quote, and even a comma to delimit the field. This same find and replace technique can locate a number followed by a space, replace it with the number and a comma to create a delimited file.

These techniques were used to create Figure 5 which is a clean data file that can be imported into a spreadsheet or database management program. Some programs would not even require the insertion of the commas because it is structured as a fixed length file as well.

Notice that in Figure 5, the heading information has been removed. It will be necessary to jot down the meaning of each column of information in order to include short field names as column headings.

In dealing with this type of tabular information, it will be necessary to dig deeply into the instructions for your word processor. If there is no indication of the ability to perform complex find and replace operations, it may be necessary to purchase a new program. PC-WRITE can be obtained free as shareware and can perform all the operations described above.

Converting tabular downloaded data into an analyzable format can be tedious, time consuming work. In such cases, whether it should be performed by the library staff or the end-user is a valid question, but one that cannot be answered here, since it depends on the organization.

However the possibilities do exist for taking a great deal of downloaded data and converting it to analyzable form. Whether it be via the DIALOG REPORT command, a special software package such as Spreadsheet Link, or through word processing magic, numbers can be captured in a form that is susceptible to complex calculating methods.

FOOTNOTES

1. This is not to say that text data cannot be analyzed in this way as well. However, such statistical analysis is most usually performed by bibliometricians rather than typical end-users.
2. For a succinct description of this new feature see: "New REPORT Formats for Post-Processing" in DIALOG CHRONOLOG 86: 244-5, November 1986. To find the databases supporting the REPORT feature, use the explain command **?REPORT** while in DIALOG.
3. This problem may have been corrected in Lotus 1-2-3, Version 2. But check before using the delimited option.
4. DIALOG has been informed of the problem in Lotus and may change the downloading of blank fields of numeric data to compensate.

FIGURE 1: FIXED LENGTH DOWNLOADED FROM DIALOG

```
0         1         2         3         4         5         6         7         8         9         10        11        12        13
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
                                                    TTL CUR   TOTAL
COMPANY                                             ASSETS    LIAB      SHARES OUT                      CASH      CURRENT
NAME                              CITY              ($000s)   ($000s)   CURRENT     EMPLOYEES  ($000s)   RATIO
BAY HEAD VENTURES INC             BAY HEAD          1         11        242500                 1         0
TOTAL RESEARCH CORP               PRINCENTON        1200      1363      1098450    408         71
C E P INDUSTRIES INC              PISCATAWAY        540       507       18950043   12                    1.19
INCON PACKAGING INC               ROSELAND          66556     51580     1000       2800        61
MELROSE FUNDING CORP              MOUNT LAUREL      10        4         2000000    3           10        2.53
W I N E INC                       NUTLEY            159       37        5950000    3           71        4.33
INTEGRATED RESOURCES LIFE INSU    FORT LEE          60363     126774    1500000                2696      2.09
USC INC                           RED BANK          5         7         1500000                5         0.77
ALPHEUS TECHNOLOGY INC            PARSIPPANY                  92        2010119    2
```

The REPORT format was used to download these nine records in fixed length fields. The line of numbers across the top help define where the fields begin and end. This line was not downloaded, but was added offline.

FIGURE 2: DELIMITED (COMMA SEPARATED) FIELDS DOWNLOADED FROM DIALOG

```
" "," "," "TTL CUR","TOTAL"," "," "," "," "
"COMPANY"," ","ASSETS","LIAB","SHARES OUT"," ","CASH","CURRENT"
"NAME","CITY","($000s)","CURRENT","EMPLOYEES","($000s)","RATIO"
"BAY HEAD VENTURES INC","BAY HEAD",1,11,242500,,1,0.10
"TOTAL RESEARCH CORP","PRINCETON",1200,1363,1098450,408,71,
"C E P INDUSTRIES INC","PISCATAWAY",540,507,18950043,12,,1.19
"INCON PACKAGING INC","ROSELAND",86556,51580,1000,2800,61,
"MELROSE FUNDING CORP","MOUNT LAUREL",10,4,2000000,3,10,2.53
"W I N E INC","NUTLEY",159,37,5950000,3,71,4.33
"INTEGRATED RESOURCES LIFE INSU","FORT LEE",60363,126774,1500000,,2696,2.09
"USC INC","RED BANK",5,7,1500000,,5,0.77
"ALPHEUS TECHNOLOGY INC","PARSIPPANY",,92,2010119,2,,
```

This is the same set from DIALOG that was in Figure 1, but it was downloaded in delimited format.

FIGURE 3: DATA INTERCHANGE FORMAT (DIF) DOWNLOADED FROM DIALOG

```
TABLE
0,1
" "
VECTORS
0,4
" "
TUPLES
0,12
" "
DATA
0,0
" "
-1,0
BOT
1,0
" "
1,0
" "
1,0
"TTL CUR"
1,0
"TOTAL"
-1,0
BOT
1,0
"COMPANY"
1,0
" "
1,0
"ASSETS"
1,0
"LIAB"
-1,0
BOT
1,0
"NAME"
1,0
"CITY"
1,0
"($000s)"
1,0
"($000s)"
-1,0
```

This is a segment of the set in Figures 1 and 2, downloaded in DIF format. Note the use of separate lines for each data element.

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FIGURE 3 (continued)

```
BOT
1,0
"BAY HEAD VENTURES INC"
1,0
"BAY HEAD"
0,1
V
0,11
V
-1,0
```

FIGURE 4: ORIGINAL TABLE DOWNLOADED FROM CENDATA

5/5/14
100254
CIVILIAN EMPLOYMENT, CIVILIAN UNEMPLOYMENT RATE, NONAGRICULTURALEMPLOYMENT, EARNINGS, PER CAPITA INCOME
February 20, 1985
Section: 08 (General Data)

	Civilian Employment, Percent Change 1982-1983		Civilian Unemployment Rate, 1983		Services as a Percent of Non agri. Employment, 1983		Average Annual Pay, 1983		Money Income Per Capita 1981	
	Percent	Rank	Rate	Rank	Percent	Rank	Dollars	Rank	Dollars	Rank
US . .	1.31	X	9.6	X	21.82	X	17,544	X	8,693	X
AL . .	3.75	9	13.7	3	16.54	46	15,542	36	6,982	45
AK . .	10.16	1	10.3	15	18.31	41	28,720	1	12,107	1
AZ . .	4.95	4	9.1	24	22.27	17	16,667	25	8,413	28
AR . .	0.33	38	10.1	16	17.43	44	14,327	47	6,696	49

FIGURE 5: CENDATA TABLE "CLEANED" WITH COMMAS INSERTED

```
"US . .",  1.31,  0,   9.6,  0,   21.82,  0,   17544,  0,   8693,  0,
"AL . .",  3.75,  9,   13.7,  3,   16.54,  46,  15542,  36,  6982,  45,
"AK . .",  0.16,  1,   10.3,  15,  18.31,  41,  28720,  1,   12107,  1,
"AZ . .",  4.95,  4,   9.1,   24,  22.27,  17,  16667,  25,  8413,  28,
"AR . .",  0.33,  38,  10.1,  16,  17.43,  44,  14327,  47,  6696,  49,
```

The Find and Replace function on a word processor has been used to "clean" the table in Figure 4, resulting in this table which can be read by data analysis software.

THE AUTHOR

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THE INVISIBLE DRIP. . . How Data Seeps Away in Various Ways

by Margaret A. Cribbs

"Although certain forms of computer memory may be superior to paper and print for long-term storage, information in a computer memory remains vulnerable. It remains vulnerable because it may exist in only a single copy or, with backup capability, in a very limited number of copies. In this respect, an electronic environment resembles a nonliterate society, where the society's vital religious myths, literary creations, and genealogical traditions may be preserved in complete form in the minds of a handful of individuals. Just as a nonliterate society takes great pains to ensure that these individuals survive to pass on their knowledge to the next generation, it will be necessary in an electronic environment to pay special attention to the protection and care of computer memories. Otherwise, a single disaster could destroy a portion of the stock of knowledge."[1]

May whoever steals or alienates this book,
or mutilates it,
be cut off from the body of the church
and held as a thing accursed,
an object of loathing.[2]
A popular Medieval anathema

As scribes we may assume that the action of inscription, be it on clay tablet, marble, vellum, or paper, has permanence according to the apparent durability of the material onto which we write. We have always understood the nature of writing materials—that they must be protected from fire, water, or corrosive elements in order that the information they contain remain legible. In general, barring natural, recognizable disaster, when we write we trust that our inscription will endure of its own accord.

The advent of electronic inscription has changed the nature of committing thoughts to written words. Those words are initially represented as lights on a terminal screen, as easily erased as they are produced. Their permanence is not as apparent, not as literal, as it was before. With this in mind it can be chilling to note that many of the most important of our documents including civil records, financial transactions, and government documents, are initially inscribed not onto paper but onto magnetic media, and that some are never converted into printed form.

The reason that this thought may prove chilling is the inherent vulnerability of electronic data. While the conversion to electronic information processing allows for far more facile retrieval, editing, and storage, there remains a risk of losing stores of data through lack of foresight in electronic information management.

THE ACTIVE DESTRUCTION OF DATA

Much has already been written on the active destruction of electronic data, especially as it concerns electronic publishing. As Gordon B. Neavill points out, "the malleability of information that is one of the major advantages of com-

►

of 1
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puter-based electronic systems, has as its corollary the potential transience of information. Nothing inherent in the technology of computer-based electronic systems ensures that information in the system will survive."[3]

Since electronic publishing allows for information sources to be produced online, it also allows them to be edited online. Online editing can blur the distinction between editions in cases when an earlier text never saw the light of day, and can cause bibliographic citation problems in cases when an earlier edition was purged while the information contained therein was cited elsewhere as a source.

Further, online editing in electronic publishing has long-term historical implications. "Because of erasures of electronic records, future historians may know less about the Reagan Administration's 1985 arms control initiatives than about those of 1972 which led to SALT I or, for that matter, those of 1921 which led to the Washington naval treaties."[4] As a result of online editing of government documents, historians will also be denied the study of legislative processes through the analysis of preliminary drafts of documents. To continue the illustration above, we shall know more about the political philosophies—those accepted for publication, and those rejected—behind the creation of the Declaration of Independence than we shall about key documents created in the 1980's.

Data are also submitted to "active" destruction due to lack of archival storage practices. Just as a print publisher pulps unsold volumes to avoid costly storage, so may an electronic publisher purge unsold works from a database. The difference, of course, is that such works may never have been printed or preserved anywhere. Further, electronic publishing allows for the unfettered purging of past issues of indices, price lists, and the like; and lastly, it allows for data stores to vanish when a publisher goes out of business. Repercussions of this loss of material span all disciplines of intellectual endeavor including literary, scientific, philosophical, and historical.

The intent of this article is not to assess blame for the winnowing of our cultural and scientific heritage. Nor could the author hope to propose solutions to the questions regarding what should be retained and who should pay for it. The above examples are cited to illustrate part of a much discussed subject in the field of library and information science—preservation of the content of electronically-produced data. This article is intended to present a very seldom mentioned issue in information management: the lack of proper care in the storage of that information, i.e., the passive destruction of data.

Following a definition of the issue of passive destruction of data, three case studies involving the long-term retention of machine-readable data will be presented. Two of the studies, those concerning OCLC (Online Computer Library Center), and the National Aeronautics and Space Administration (NASA), involve the retention of data on specific media: magnetic tape and compact disk—read only memory (CDROM). The third describes the transfer of data from one hardware system to another, as completed by the Research Libraries Information Network (RLIN).

THE PASSIVE DESTRUCTION OF DATA

Poor planning and insufficient research on the part of information managers can cause data to disappear without our being aware of the loss. In the first place, hardware dependence should be taken into consideration. Will the data processed on the computers used today be transferable to the machines put in place when equipment is upgraded? Software dependence is another issue. Are we insisting on the proper documentation and, if possible, the standardization of software so that fifteen years from now researchers will be able to decode data? Third, we must be aware of the life span and the vulnerability of the media on which we archive. Are we providing optimal conditions for the data retention, and are we transferring the data to fresher, or more durable media within an appropriate time frame?

Will the data processed on the computers used today be transferable to the machines put in place when equipment is upgraded?

Hardware dependence

Hardware upgrades are common as organizations follow the progress of the computer industry's meteoric growth, and buy accordingly. Such upgrades can have negative effects on the data that have already been produced and archived, if old data cannot be read by new machines. Much governmental material, for example, has a permanent retention schedule, and so will very likely outlive the hardware on which it was produced. This can be dangerous, as can be seen in the statement that "by the mid-1970's, when computer tapes for the 1960 census came to the attention of archivists, there remained only two machines capable of reading them. One was already in the Smithsonian. The other was in Japan."[5] ►

Will the data processed on the computers used today be transferable to the machines put in place when equipment is upgraded?

A second example illustrates how this problem might effect smaller institutions. In the early 1980's, the directors of Casalini Libri of Florence, Italy decided to automate their international book distributorship by purchasing an integrated system from Digital Equipment Corporation (DEC). After two years of inputting and extreme dissatisfaction with the system, the directors made the difficult and costly decision to sell the Digital ensemble. They decided to continue operations on an IBM 3600 with software generated in-house. Although operations now run smoothly at Casalini Libri, the fact remains that two years' worth of business records including bibliographic entries, orders, claim responses, and client information, are effectively lost because those data are stored on magnetic tape readable only by a machine that the company has sold.

An even more pervasive problem lies in the unmonitored acquisition of microcomputers. As of 1983 there were approximately 18,000 mainframe computers in use by the United States Government, but the Government Services Agency reports that "no one has yet been able to estimate accurately the number of word processors and micro- and minicomputers used by federal agencies."[7]

The government is not the only institution in this situation. Unchecked hardware acquisition on the microcomputer level pervades institutions of every kind, since microcomputers are well within the budgets of small businesses, small libraries, or, in many cases, individual departments of larger entities.

Often one institution supports different types of hardware in the same office. For example, The Bank of Boston runs half of its central operations on Wang computers and the other half on IBM PCs. In another more dramatic instance described in a 1984 issue of *Harvard Business Review* "in one division of a major manufacturing company the data processing budget is $25 million. Managers knew about the proliferation of personal computers inside the company, but they did not realize that the small, single expenditures added up to $14 million and that there is a strong likelihood of unmanaged end-user investment and operating expenditures exceeding the central computing resource by 1985."[8]

In cases such as these, part of the problem lies in the fact that data produced on one type of machine are difficult to transfer to others. Another resides in the hidden costs of standalone systems. Authors of the article quoted above note that "if software, extra disk storage, printers, modems for communications, and so on are added, the cost of $3,000 per unit may

grow as high as $6,000 to $10,000. If the machines are incompatible with the company's main computing communications equipment, much of the investment may have to be written off."[9]

As a solution to the problem of haphazard microcomputer procurement, the authors recommend that managers form a policy for information management. Such a policy would emphasize coordination of hardware for all computing and word processing tasks institution-wide. This mandate also would describe the decisions which have been made about the "longer term technical architecture for the company's overall computing resource, with personal computers as one component."[10]

Software dependence

Even more frequent than one institution's operating with a number of different computer systems, are cases in which one section of an operation might produce data on its preferred software, and another section might carry on with a different package. Should record keeping of the disks or tapes fail to reveal the type of software used to produce the data, even well-preserved data will be inaccessible without the software key.

A more technical, and perhaps a more profound problem involves software produced for specific tasks within an organization. Problems of accessibility may arise due to poor or non-existent documentation for software produced in-house. "Instructions for processing the tapes may not exist or definitions of the codes may be missing. In racial codes, for instance, *B, W, O* might stand for *black, white, other* or *black, white, oriental*."[11]

Prevention of missing or misunderstood software support material may lie in the establishment of library procedures by which a piece of software and its accompanying documentation should be fully catalogued and cross-referenced. It also may lie in the establishment of standards which would affect how software is produced. The recommendations of the Committee on Data Management and Computation (CODMAC) include clear suggestions that space science software be produced according to standards for "documentation, development methodologies, languages, protocols, libraries, and portability."[12]

That final issue of "portability" also deserves special consideration:

> *"The issue of software portability must be addressed by any group that sees itself in existence even five years in the future. Major software projects are a large, and necessary expenditure that must be protected like any other investment. Software must be derived in such a way that it is portable across operating systems. This ensures the ultimate longevity of the software as well as easing the transition across local operating system upgrades."*[13]

VULNERABILITY OF STORAGE MEDIA

Magnetic media

Magnetic media, on which the bulk of machine-readable data are stored, are susceptible to heat, sunlight, humidity, extreme dryness, magnetism, dirt, cosmic rays, and accidental erasure. The most common instructions to preserve data stored on computer tape, for instance, dictate first that care be taken to keep the tape in an environment which promises 60-70 degrees Fahrenheit and 50 percent humidity, and second that the tape be refreshed by rewinding on a semi-annual basis.

This type of care proves to be only part of that which is imperative for the long-term retention of data on magnetic tape. Other safeguards involve constant attention to the cleanliness of the drives on which the tapes are read, and necessitate the production of back-up copies of data sets, all of which would be stored in a separate, environmentally correct, storage facility.

Following interviews with a number of tape managers, it has become evident that there is relatively little concern with the loss of data from, or eventual deterioration of, magnetic tape. Most tape managers interviewed for this study seemed to trust magnetic tape implicitly, regardless of the environment they provide for it. The only exception was Mike Martin at NASA's Jet Propulsion Laboratory, a person who over the years has had to reckon with much older tape in much more critical situations than managers connected with shorter-term storage.

Most tape managers interviewed for this study seemed to trust magnetic tape implicitly, regardless of the environment they provide for it.

The fact remains that even when conditions and refreshment procedures are ideal, the nature of magnetic media allows for mishaps. One such case involved the tape on which raw data from the Mariner 9 spacecraft were stored. After the 1971 mission was completed, data managers at Jet Propulsion Laboratory ►

copied the original tapes in order to make backups, and subsequently found that after having been copied the originals were unreadable.

No data were lost because they had been successfully copied. Nevertheless, what originally seemed to be viable tape had a fundamental defect. If the tape had been archived and left unread for several years, then occasionally rewound as is the common practice, invaluable data would have been lost.

Further, even when the product used is of the highest archival quality, magnetic tape simply wears out over time. "The National Bureau of Standards has judged the longevity of modern magnetic tape to be about twenty years under ideal storage conditions."[14] The same time frame applies to other magnetic media such as floppy disks and magnetic hard disks.

Optical media

Contrary to popular computing folklore, even digitally encoded disk media—optical disks and compact disks—cannot be expected to last forever. The National Bureau of Standards has yet to complete longevity testing for optical media currently on the market. Research done by the producers themselves, however, estimates that write-once optical disks on a twelve-inch format have a life span of ten years.[15] This shorter life expectancy is thought by some to be due to the action of writing onto the disks, which may destabilize the surface in a way that makes it prone to deterioration.

Much less concrete evidence exists to reveal the life span of the compact disk—read only memory (CDROM). At a recent meeting of CODMAC held in Pasadena, California, Mike Martin of the Jet Propulsion Laboratory suggested a life expectancy of no less than forty to one thousand years for the disk. He cautioned, however, that although we know the medium to have superior longevity, no one knows exactly how long the CDROM will last because of the lack of longevity testing results from both the National Bureau of Standards and from the producers.[16]

The reason for the long life expectancy of CDROM involves the fact that it is pressed from a master, forming microscopic pits on the disk surface, each of which represents a fraction of digitally-encoded data. (This impression of data on a surface, Martin noted, likens CDROMs to the books produced on the earliest printing presses, or, for that matter, to earlier inscriptions on clay or stone.) The result is that the pressing of pits into the disk represents a transfer from one stable medium to another, increasing the longevity of the medium.

It should also be noted that although optical media of any type do wear, they do so far less

Many vital records never take the form of ink on paper. Consequently, long-term information management involves an understanding of the notions of preservation and storage for archival purposes.

rapidly than other storage media. This is due to the fact that optical media are read by the passing of laser beams over the disk surface, instead of the scratching of a needle into a groove or the passing of a tape read head very close to a magnetic surface. This lack of mechanical friction can allow a disk to remain in very good condition even through heavy use.

THE NOTION OF TRANSFER

When so many vital records never take the form of ink on paper, responsible, long-term information management involves not only an understanding of the notions of preservation and storage for archival purposes, but also of transfer, due to the vulnerability of the media on which data are recorded. Records and tape managers must assign both retention *and* transfer schedules to data sets. In the case of vital records stored permanently on magnetic tape, the tape should be rewound and read at least annually to ensure its viability. Transfer to fresh tape should occur at some time around ten years from the date of the tape's recording, regardless of the amount of read time the tape has had.[17]

As is mentioned earlier, it is harder to predict how optical media will fare in longevity testing. Users of CDROMs, however, report excellent built-in error correction that indicates a disk's wear. By keeping an eye on the amount of error correction per reading, the user can judge when to transfer the data to another, fresher disk. For any optical disk medium, plans should be made and budgets set for periodic transfer of vital data to fresh disks in order to ensure that the data are retrievable and clearly legible through the years.

At the CODMAC meeting, in a discussion of data retention with one of the committee members, that member stated that probably 85 percent of the data sets being preserved by government-sponsored scientific organizations were useless because of the issues of hardware and software dependence mentioned above. Sponsoring organizations continue to allocate money and staff time as a nod to data preservation, even though those data are on the road to obsolescence and everyone closely involved knows it.

In this regard, the elementary notion of transfer must be further extended to its more important and more fundamental tenet: from the outset of the production of data sets to be retained over the long term, budgetary and data processing groundwork must be laid for the eventual transfer of data to successive hardware and software formats. This procedure will prove costly and difficult at the outset, but may in itself usher in, through acknowledgment of the necessity of retaining vital data, an age of standardization, and more importantly, of accountability in data management.

CASE STUDIES

As mentioned in the introduction, three case studies will be offered to illustrate means of retention of machine-readable data over the long-term. These are practical examples, each with pros and cons—usually cost-related. These are not presented as ideals, but as common solutions to pervasive problems.

The first example, OCLC, illustrates one type of preservation of data on magnetic tape. The second, NASA's Planetary Data System, illustrates both preservation through the use of CDROMs, as well as the philosophy of distribution of data sets to facilitate local research and to ease the query burden of a central archive. The third, RLIN, illustrates means of keeping a large database intact despite the upgrading of system hardware.

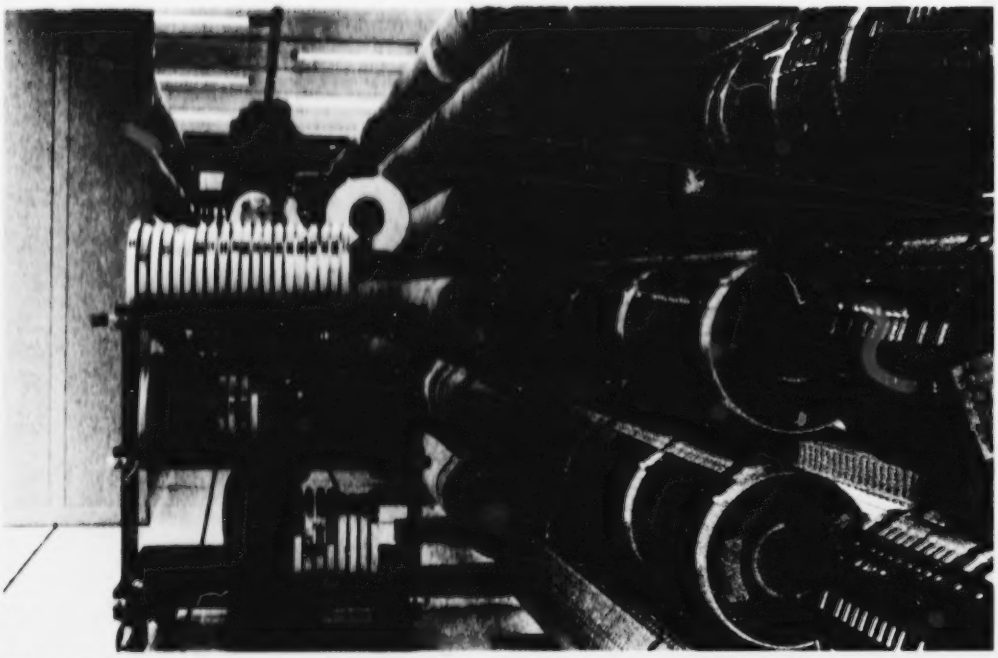
OCLC

OCLC and RLIN both serve as electronic catalogues to thousands of users worldwide. Their databases comprise millions of bibliographic records, stored online for consultation by contributing libraries and other institutions. Most of these institutions have individual accounts with such utilities, accounts which allow the user to consult and update their own holdings online, as well as to consult the holdings of other member institutions.

All bibliographic utilities offer printed products such as accessions lists, shelf list cards, and catalogue cards, culled from a client's subset of the main database. As time passes and as a growing number of libraries close their card catalogues in favor of online systems, the bibliographic utilities serve to preserve and publish their holdings electronically.

The electronic publications with which we are concerned include both the information available daily through telecommunications, as well as through distributed services. These latter services allow for a library with an in-house online catalogue to subscribe to tapes of their own transactions (adds, changes, and deletes) performed on the utility database. Such tapes are then loaded onto the local system to allow for public access, circulation, and other in-house functions. Because of the importance of their role as centralized custodians of many different, smaller databases, it is of supreme importance to these utilities that provision be made for the preservation of these data over the long term.

OCLC (Dublin, Ohio), currently assigns a permanent retention period to all of the data it ►



OCLC Tape Library: The keeping of exhaustive archives necessitates a costly tape management system. Provisions must be made for new tape, for periodic readings, and for climate-controlled storage space.

stores. This utility generates two types of backups to prevent data loss in case of a sudden, system-related failure. First, OCLC generates system-wide transaction tapes daily, sorts them in alphabetic groupings representing the first letter in the client code (A-C, D-F, etc.), and files them. Second, it generates periodic "upsaves" which capture the entire database at one time. These upsaves also are sorted according to client. One copy of the most recent upsave always remains on-site, in order that technicians might start work on reconstruction immediately if the nature of a problem allowed for it. Another copy resides in off-site storage.

Part of the reason that OCLC goes to the trouble of maintaining such a massive tape archive is its emphasis on customer service. In the case of a client's losing an entire local database in one stroke, for example, transaction tape retention provides OCLC with the ability to reconstruct the file by sorting through the tapes compiled since the beginning of a client's online activity. Another reason involves the concern with reconstructing the main database in case of a massive system crash.

The keeping of such exhaustive archives necessitates a costly tape management system, as provisions must be made for new tape, for periodic readings, and for climate-controlled storage space. With so many tapes in storage, it becomes difficult to tend to them in as meticulous a manner as possible. OCLC tape managers wait five years with no rewinding or cleaning before reading a tape for errors.[18] No transfer is ever effected, but the older tapes are read periodically to check for errors, in which case the data can be reconstructed from other sources.

NASA

In order to ensure successful long-term retention and retrieval of space science data, the National Aeronautics and Space Administration created the Planetary Data System (PDS), to be centered at the Jet Propulsion Laboratory (JPL) in Pasadena, California. PDS managers have committed raw data from space missions to CDROMs, and distributed the disks to researchers in the planetary research community. The project initiated its storage and distribution cycle with the data transmitted from Voyager 2 during its encounter with the planet Uranus in the early months of 1986.

Reasons for implementation of such a system reside in the history of data management at NASA. In most cases of scientific experimentation in space, individuals or institutions are invited by NASA to submit proposals for experiments, and for the instruments which would perform them, years before the launch of a spacecraft. After a set of accepted experiments

JPL's Mike Martin (left) and Frank Kuykendall demonstrate the RTI Series Compact Disk—Read Only Memory (CDROM) using the Compaq portable computer and the Sony Compact Disk Unit-1 (CDU-1).

are incorporated into the mission, any data transmitted from the spacecraft by the scientific instruments on board are forwarded immediately on magnetic tape to the Principal Investigator (PI) who submitted the proposal, whereupon those data are processed.

In general, PIs are encouraged to return to JPL the raw data tapes for permanent archiving, but the tapes do not always find their way back to the Laboratory. Because of this, tapes of raw data from space missions become scattered and are therefore inaccessible for eventual queries from other members of the planetary research community. In cases when the tapes return to JPL, some have fallen prey to the problems of hardware and software dependence mentioned earlier. Like the reels of Mariner data, they may have been properly tended, but they can no longer be read.

The Planetary Data System proposes to use CDROMs instead of magnetic tape for reasons of efficiency, of cost, and of expected longevity. In the first place, making several hundred copies of planetary data from one master proves far more cost-efficient than duplicating reels of magnetic tape. Distributing those CDROMs allows other scientists to review the data after the PIs have finished with them, and spares them the trouble and cost of tracking down those data on their own. Further, committing the data to CDROMs saves NASA the cost of storing and caring for thousands of reels of relatively vulnerable and constantly deteriorating magnetic tape.

PDS directors are aware of the uncertain longevity of the disk medium, but they are encouraged by the error-correction readings which can be used as a monitor of deterioration. Data transfer to newer disks remains a viable option. They are encouraged as well by the other benefits presented by CDROMs. Of all optical media, the CDROM is the only one in which disks and readers are being produced according to an industry standard, set by co-developers NV Philips and Sony.[19] Standardization provides the assurance that the highest number of people will be able to view the NASA data with the least amount of cost and inconvenience.

In addition, storage proves far cheaper, since one CDROM, a disk 4.72 inches in diameter and less than one-tenth of an inch thick, stores nearly 540 megabytes of data. For NASA's purposes, this approximates the amount of data contained on five standard reels of 6250-bpi magnetic tape. A third consideration involves the fact that CDROMs are not susceptible to heat, sunlight, magnetism, dust, or to anything short of having the plastic coating peeled off. Hence, the need for climate and humidity control in a storage environment is reduced.

As stated by Don Brown at RLIN, in a hardware changeover, data are seldom actually lost. Any data can be reformatted, but usually at considerable cost. For RLIN, incurring expense to retain data is imperative.

RLIN

A change of hardware need not be as traumatic as it proved for Casalini Libri in the case cited earlier in this article. As stated by Don Brown at RLIN, in a hardware changeover, data are seldom actually lost. Any data can be reformatted, but usually at considerable cost. For a small business, this expense can be too heavy to incur. For a larger concern, such as the Research Libraries Information Network, incurring expense to retain data is not only worthwhile, it is imperative.

The case of RLIN, a bibliographic utility located in Stanford, California, is one which illustrates the importance of standards. When the directors of the institution decided in 1985 to change mainframes, the massive database was transferred, in Brown's words, "by unplugging one machine and plugging in another."[20] RLIN directors had chosen to restrict their upgrade choices to systems which were compatible to the existing IBM operating system, and hence the switch over did not necessitate any change in format of data, nor any adjustments in protocol.

RLIN currently supports thirty-one member institutions and some one hundred search-only users.[21] Brown estimates that one thousand users logon to the RLIN system daily, accessing the single file which encompasses thirty billion bytes of data. These data reside currently in ninety-five logical disks, and are shepherded by an Amdahl 5880.

In order to ensure the integrity of the database in case of a disk crash or other disaster, twelve copies are kept on magnetic tape as back-ups, each representing one week's transactions. In the case of a serious disaster, the database could be rebuilt from the "snapshots" recorded over a twelve week time period previous to the cut-off. One of these copies lies in remote storage. The other eleven are stored at RLIN. After the twelve week retention period has elapsed, the back-up tapes are purged and recycled.

While on the microcomputer level the struggle for standards continues to wage between IBM and Apple, on the level of higher computing capability, IBM has decidedly won the day. According to Brown, the IBM operating system dominates machines of levels of computation up to but short of the supercomputers used in space and earth science computation. IBM also takes care to ensure that operating systems are upwardly compatible. This fact accounts for RLIN's having to perform no adaptation of data format or protocol upon the purchase of the higher-capacity, faster Amdahl system.

Institutions with databases which must be preserved need not be restricted to a certain

type of hardware, as long as they are willing to pay to provide equipment which can translate between systems. In RLIN's case, all of the telecommunications gear connecting users across the continent to the Stanford facility is DEC equipment. Despite the fact that this hardware was designed by and runs on entirely different specifications than those of the IBM or Amdahl, it nevertheless communicates with those mainframes because of intermediary equipment which RLIN has installed.

RLIN maintains a dynamic database which stores the bibliographic records for and provides updating services to library users each working day of the year. Unlike NASA's data which are separated into discreet and historically distinct sets, theirs is an ever growing and changing single set. To RLIN, long-term preservation of the database represents the stock-in-trade for the institution, hence the attention to efficient and quick transfer of data through the choice of compatible hardware systems.

CONCLUSION

These case studies represent three separate situations and three different methods of coping with challenges of long-term retention of data. The element that they share, apart from the preservation of data in one form or another, is a concern about balancing the worth of the data being preserved against the cost of preservation.

In OCLC's case, we have a not-for-profit organization intent on providing for any data-loss eventuality. In light of the archiving burden OCLC has taken on and the costs it must incur, questions must be posed about the provisions made to preserve the tape itself. Is the current refreshment and conservation policy sufficient to preserve all the data, or might OCLC be paying a heavy toll to carry dead weight?

RLIN chooses to retain much less data. Twelve days of snapshots will have to suffice to rebuild the main database in case of a major system crash. Their trade-off involves the risk of data loss and practically precludes the promise of local database reconstruction, but it does prove easier for them from both viewpoints of space management and of cost efficiency.

As Don Brown at RLIN affirmed, data are seldom literally lost through hardware or software changeovers, but they are lost in effect when the cost of recovery becomes prohibitive. By the same token, systems may be incompatible, but seldom are the cases in which no hardware can be built or program written to effect data transfer from one system to another. It just has to be financed.

By choosing an IBM-compatible system for their new mainframe, the directors at RLIN circumvented the cost and extra effort it would have taken to bring an earlier operating system into conformance with a newer configuration. On the other hand the decision to choose DEC equipment for remote terminals exhibits a case in which RLIN was willing to provide for the translation from one system to another, costs notwithstanding. RLIN has chosen not to retain data on storage media over the long term, but does provide for the long-term retention of data through its attention to system maintenance.

NASA's PDS combines the sense of scientific purpose with a sensitivity to costs in its program to store and disseminate planetary data. Downplaying the risk involved in committing a major retention program to a relatively new medium, PDS directors focus on the medium's promise of longevity and on the immediate savings which lie in reduced storage and reproduction costs.

In addition, it cannot be denied that one form of long-term retention of data is the dissemination of those data. On a very elementary level, this is one of the reasons why off-site storage is recommended—to provide for back-up in case of on-site disaster. On a more profound level, though, it can be reasoned that the dissemination of information allows for its absorption by a number of different people, thereby prolonging the information's life and its usefulness.

Producers of information in machine-readable form should understand that data may well be destined to outlive the systems on which they are produced, but that often they cannot survive because of neglect. Should data be slated for long-term retention, therefore, from the onset of their production provisions must be made for maintenance through the application of standards and the employment of system-to-system transfer techniques. Further, data managers should understand the vulnerability of any storage medium they choose to employ. Standard operating procedure should include regular testing for error deterioration, particularly in the case of magnetic tape, which is subject to so many environmental adversities. Finally, the most crucial precautions remain the maintenance of archives with proper environmental control, and the transfer of data to fresher or more durable storage media as time passes.

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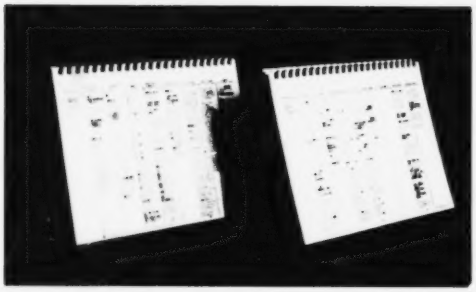

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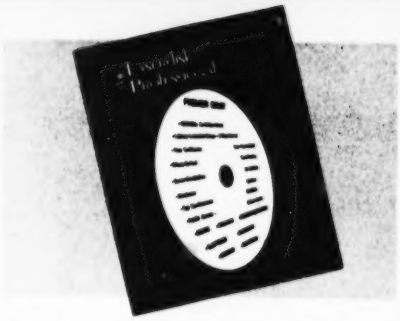

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